Science, Fiction, and the Monthly Magazines 1891-1905

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Abstract

Many studies of the interrelation of literature and science are content to ignore Science Fiction (sf), a genre whose very name appears to locate it on the fault-line between the two. This thesis seeks to redress this deficiency by examining early examples of sf in the material contexts of their first publication, drawing out correspondences between imaginative writing and the other forms of fiction and non-fiction alongside which it appeared.

Following on from Gillian Beer's notion of 'two-way traffic' as an ameliorative means of understanding the constructive (and constructed) relationships between science and fiction, this project considers popular magazines an enabling form whose commercial insistence on diversity of content maintained discursive possibilities between different kinds of writing. The illustrated monthlies which formed the vanguard of the New Journalism in Britain – the *Strand Magazine*, the *Idler*, *Pearson's Magazine*, and *Harmsworth's Magazine*, for instance – were a natural home for sf because of the heteroglossia they evinced: popular science, interviews, curiosity pieces, essays, editorials, and advertisements rubbed shoulders with many species of fiction. Editorial efforts to reconcile these disparate voices into a publication with a stable, saleable 'personality' often emphasised connections at a time when increasing professionalization was fragmenting much scientific and literary discourse.

This thesis re-establishes some of those connections by placing these writings back into conversation with each other, close reading magazines' correspondences with four topical science-fictional themes – x-rays, interplanetary communication, polar exploration, and future-prediction – to emphasise harmonies which the construction of specialised and isolated narratives for disciplinary history has tended to occlude. This approach not only shows more fully the emergence of sf in its cultural and material context, but also

challenges the present-day conception of absolute and essential dyadic division – between modes of writing, between academy and public, and, of course, between literature and science.

Acknowledgments

PhDs are written to be buried in library stacks, and there is a myth that their production takes place in similarly isolating conditions. The following list of names proves that in my case at least, this is not true. I suspect that any thesis – but particularly this one, with its central argument that ideas are richer the more connected they are – depends implicitly on the support and feedback of a large number of people.

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Introduction

> The rigid divisions between disciplines, the lack of mutual comprehension, the misplaced feelings of superiority or disdain in different professional groups – these should be seen as *problems*, not fatalistically accepted as part of the immutable order of things.[1]

Dyadic division – the understanding of two categories as not only distinct but opposed – is, as Stefan Collini suggests in my epigraph, a habit in many of us. It is often a bad one. Collini is writing here about the division between literature and science, Bruno Latour's 'no-man's land' across which the science wars of the 1990s were fought.[2] Such conflicts necessitate reductive portrayals of both sides, stereotyped impressions which can pass into popular consciousness and become extremely damaging. Both the sciences and humanities in Britain currently face ministerial scepticism about relevance; both are turning increasingly to the language of 'impact' to defend themselves, justifying their activities as an economic investment rather than in terms of the pursuit of understanding. This failure to convince the public of the value of education and research is partly attributable to the commonplace that both literature and science operate in ways which are somehow too abstracted from 'real life', an impression which episodes like the science wars do little to dispel. And yet this impression, with its damaging consequences, constitutes a problem shared variously by the

[1] Stefan Collini, 'Introduction', in *The Two Cultures*, ed. by Stefan Collini (Cambridge: Cambridge University Press, 1998), p. vii–lxxi (p. lx–lxi). Original emphasis.
[2] Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), p. 17. For an account of the 'science wars', see for e.g. Alan Sokal, *Beyond the Hoax: Science, Philosophy and Culture* (Oxford: Oxford University Press, 2008), pp. 115–17.

whole academy, literature, sciences, and beyond, and a solution has the potential to ease the relationships between them.[3]

Scholars in the humanities are increasingly recognising that intersections between literature and science can stimulate creativity or provide historical insight as well as provoke misunderstandings and conflict. Studies in this field have crystallised around the name 'Literature and Science'.[4] However, due in part to the areas of expertise of those leading these investigations,[5] and in part to entrenched prejudices within the academy against demotic literature,[6] Literature and Science has tended to emphasise correspondences between science and individual, usually canonical authors, or else the reading habits of elite scientific thinkers. This thesis contends that whilst this approach is important, the transmission of ideas into *popular* culture is also pertinent to the past and future of both literature and science. Focusing on science fiction, the popular genre whose name situates it so provocatively on the literature/science divide, I proceed from the understanding that it is before the public that literature and science become most thoroughly intertwined, and, in a democracy, it is there that conversations about how they should be resourced are the most influential.

Ben Goldacre has drawn attention to the media's poor understanding and treatment of science, pointing out that most of the editors and writers with whom he locates blame hold degrees in a humanities subject.[7] It is equally possible to argue, as Sharon Ruston has, that misconceptions about the practice and institution of literary criticism (for example, that it is exclusively high-canonical in its focus) are responsible for some of the ire directed against it by voices both

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[3] Stefan Collini, *What Are Universities For?* (London: Penguin, 2012), pp. 101–02.

[4] The American Society for Literature, Science, and the Arts (SLSA) was founded in 1985 (as the Society for Literature and Science). The British Society of Literature and Science (BSLS) followed in 2005. The BSLS is closely associated with the *Journal of Literature and Science* (published electronically from the University of Glamorgan), the SLSA with *Configurations* (Johns Hopkins University Press). The inauguration of the BSLS and the differences between it and the SLSA are discussed in Gowan Dawson, 'Literature and Science Under the Microscope', *Journal of Victorian Culture*, 11 (2006), 301–15.

[5] The most influential single work in this field is Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*, 3rd edn (Cambridge: Cambridge University Press, 2009). George Levine's work is also seen as central to the emerging study of Literature and Science. Both scholars began their writing in this area in the early 1980s; both are Victorianists. Repeat figures of interest are George Eliot, Thomas Hardy, and Charles Dickens.

[6] '…science fiction is, rightly or wrongly, not taken seriously as a genre of literature with a capital 'L', and I hope this book might be taken seriously' (Charlotte Sleigh, *Literature and Science* (Basingstoke: Palgrave Macmillan, 2011), p. x–xi).

[7] Ben Goldacre, *Bad Science*, 2nd edn (London: Fourth Estate, 2009), pp. 224–25.

from within the sciences and further afield.[8] In the belief that a more positive account of the relations between literature and science could help ameliorate the wider, mutual problems with public communication faced by their respective university departments, this study focuses on a period – the *fin de siècle* – during which the boundaries between the two were more elastic. Capitalising on this elasticity in order to stress relationships in culture at large rather than at a theoretical level, I pursue literature and science in a place where they are routinely and very visibly entangled with one another: the publications which Mike Ashley describes as 'Standard Illustrated Popular Magazines'.[9]

Ashley's term describes a kind of periodical which thrived after 1891 due to improvements in print and distribution technology which allowed them to be produced economically. The first and most successful of them was George Newnes's *Strand Magazine* (Jan 1891 – Mar 1950), which inspired numerous imitators and ushered in what Ashley calls the 'Age of the Storytellers', a period during which magazines were particularly influential on the development of fiction. Publications which followed the *Strand*'s model included *The Idler* (Feb 1892 – Mar 1911), *Pearson's Magazine* (Jan 1896 – Nov 1939), and the *Harmsworth Monthly Pictorial Magazine* (later *Harmsworth Magazine*, later still *Harmsworth London Magazine*, and finally *London Magazine*, Jul 1898 – May 1933).[10] Despite some editorial discrepancies, these monthlies had several fundamental characteristics in common:

> The magazines in question were 'standard' in size and format – about 170mm wide by 250mm tall, with spines and fore-and-aft advertising sections. They were copiously 'illustrated' with line drawings or engravings, and soon with photographs, and it was in order to provide space for their illustrative matter that such magazines adopted the standard format in the first place (a size somewhat larger than the various book-like octavo formats which the majority of sparsely illustrated Victorian fiction magazines had clung to). And they were 'popular' – that is to say, they were

[8] 'Perhaps the continuing sense that English academics study only the canon of traditional writing is the reason that we are denied the possibility of swelling the numbers of the new 'public academics' that [John] Brockman celebrates' (*Literature and Science,* ed. by Sharon Ruston (Cambridge: D. S. Brewer, 2008), p. 2).
[9] Mike Ashley, *The Age of the Storytellers: British Popular Fiction Magazines 1880-1950* (London: The British Library, 2006), p. 197.
[10] Ashley's index has full entries on all of these magazines. In general, I refer to explicit publication details only when they are directly relevant to my arguments.

> popularly priced in order to reach a mass audience, the rapid growth of which would greatly fuel advertising revenues.[11]

The last characteristic is important, for as a result of the commercial imperative on mass appeal, these magazines welcomed an extremely diverse range of content. Fiction, journalism of all kinds, verse, and popular science were all equally at home. Occasionally these different kinds of writing explicitly invite comparison – for example, when a themed short story accompanies a particular scientific breakthrough – but even apparently disconnected pieces are an attractive study from the point of view of Literature and Science, due to their physical proximity in print.[12]

Standard Illustrated Popular Magazines were a contact zone between discourses; venues for correspondences across boundaries which were also, in the *fin de siècle*, complicit in shoring them up. This is true not only of the boundary between literature and science, but of many others besides. Ashley draws attention to the role of periodicals not only 'in developing writers' but also in 'establishing the popular categories of fiction'.[13] Science fiction was one of these, a genre whose emergence can be traced explicitly to the magazines of the 1890s. The magazines are therefore not only, as they have long been considered, fascinating historical artefacts and textual repositories for anybody interested in science fiction: they also provide insight into the historical processes of dyadic division as well as offering a formal model which can help us, today, in tackling some of its contingent problems.[14]

In what follows, I understand the popular magazine as a publishing environment which maximises discursive possibilities. I argue that it is this very characteristic, and the consequent ability to hold mutually exclusive discourses in suspension, which allowed magazines to play such an active and central role in the emergence of science fiction. I propose that there are parallels between the subdivision of popular fiction into genres and the fragmentation of the academy

[11] Ashley, *Age of the Storytellers*, p. 197.
[12] 'Even as individual parts of poems or novels were being read in periodicals, in addition, they were surrounded by other stories – political, historical, scientific – on neighbouring pages' (Linda K. Hughes and Michael Lund, *The Victorian Serial* (Charlottesville, VA: University Press of Virginia, 1991), p. 9).
[13] Ashley, *Age of the Storytellers*, p. 1.
[14] For a sustained argument that periodicals should not be treated simply as a textual archive, see James Mussell, *The Nineteenth-Century Press in the Digital Age* (Basingstoke: Palgrave Macmillan, 2012), especially pp. 66-67.

caused by specialisation, and that the emergence of science fiction implicitly links the two. Without asserting that boundaries are not real, that there are not (or should not be) differences between literature and science, I suggest that constant scrutiny of those boundaries (and the historical processes which give rise to them) is essential to a mature treatment of those differences. Finally, I find that under such scrutiny, these sources repeatedly harbour an underlying concern with an issue central to literature, science, and journalism – the truth; its location, its nature, and who has access to it. Throughout this thesis, I maintain an emphasis on popular literature and the mass market, on the understanding that it is in culture at large that these divisions are mediated – and that it is there, too, where they must be approached by those who wish to affect change.[15] The remainder of this introduction is in three parts: the first deals with science fiction's history in the magazines of the *fin de siècle*, the second with the study of literature and science, and the third with my research approaches and the structure of the thesis.

I. Origin Stories

The first articulation of what would become science fiction was an exercise in magazine publishing, not one in fiction or criticism: the April 1926 appearance of the American monthly *Amazing Stories*. Its editor, Hugo Gernsback, was carving out a niche in the print market as much as in the world of fiction when he proposed, in the first sentences of his opening editorial, 'something that has never been done before', a magazine which was fundamentally different from 'the several hundreds now being published' and which '[t]herefore […] deserves your attention and interest'.[16] This prospectus, frequently quoted as Gernsback's manifesto for the genre, sets up a perimeter around a certain kind of writing, arguing for its coherence explicitly within the commercial field of the magazine.

Amazing Stories was swiftly followed by a host of other publications which between them were instrumental in science fiction's development for the next three decades, and Mike Ashley argues that magazines remain 'the lifeblood

[15] 'It's your job to notice, as we go, how incredibly prevalent [cultural misrepresentations of science are], but also to think what you might do about it' (Goldacre, *Bad Science*, p. xii).
[16] Hugo Gernsback, 'A New Sort of Magazine', *Amazing Stories*, 1 (April 1926), p. 3.

of the field' today, even despite their vastly diminished sales.[17] In part, this is because of the periodical's dialogic potential: more than simply printing stories, Gernsback sought to nurture a community of readers in developing the genre as a financial and literary enterprise.[18] He called it 'scientifiction'; by the first issue of his later magazine *Science Wonder Stories* (June 1929) he had coined 'science fiction', the name still in common use.[19]

But naming, Roger Luckhurst reminds us, 'is not the same as origin'.[20] The first issue of *Amazing Stories*, despite opening with Gernsback's strongly-worded claims for novelty ('It is entirely new – entirely different…'[21]), exclusively contains previously-published material as much as eighty-one years old (the most recent piece was just under three). Gernsback himself had been publishing science fiction in other magazines for years, two of the stories in the first number of *Amazing* having previously appeared in his own *Science and Invention*.[22] *Amazing*'s true innovation was its exclusivity of focus: in editing its first issues, Gernsback was composing a canon for science fiction, drawing the map of his new genre not with a tightly-worded definition or by offering a platonic holotype for future writing, but by grouping a selection of pre-existing stories under one label. If the magazine format provided this re-labelling capacity, it also provided the stories themselves: of the six tales comprising the first issue of *Amazing*, only one – a serialisation of Jules Verne's 1877 novel *Off on a Comet* – had not made its debut in a periodical.[23]

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[17] Mike Ashley, 'Science Fiction Magazines: The Crucibles of Change', in *A Companion to Science Fiction*, ed. by David Seed (Malden, MA: Blackwell Publishing, 2005), pp. 60–76 (p. 72).

[18] 'How good this magazine will be in the future is up to you. [...] We will welcome constructive criticism - for only in this way will we know how to satisfy you' (Gernsback, p. 3).

[19] Gernsback's switch to 'science fiction' was a legal decision – he had lost *Amazing Stories* to bankruptcy, and 'scientifiction' was determined to be an *Amazing* trademark (Ashley, 'Science Fiction Magazines', p. 63). For discussion of the arrival and development of the term 'science fiction', see Brian Stableford, John Clute and Peter Nicholls, 'Definitions of SF', *Science Fiction Encyclopedia*, 2011 <http://www.sf-encyclopedia.com/entry/definitions_of_sf> [accessed 24 May 2012].

[20] Roger Luckhurst, *Science Fiction* (Cambridge: Polity Press, 2005), p. 15.

[21] Gernsback, p. 3.

[22] Gernsback also wrote his own science fiction. His most well-known novel, *Ralph 124C 41+: A Romance of the Year 2660*, had been serialised in his *Modern Electrics* between 1911 and 1912.

[23] The full contents of *Amazing* 1:1, with the original publications and dates for each story: Jules Verne's 'Off on a Comet' part 1 (novel, 1877); H. G. Wells's 'The New Accelerator' (*Strand Magazine*, December 1901); G. Peyton Wertenbaker's 'The Man From the Atom' (*Science and Invention*, August 1923), George Allan England's 'The Thing From – Outside' (*Science and Invention*, April 1923); Austin Hall's 'The Man Who Saved the Earth' (*All-Story Weekly*, 13 December 1913); and Edgar Allan Poe's 'The Facts in the Case of Mr. Valdemar' (*American Magazine* and *Broadway Journal*, December 1845).

Instinctively or otherwise, Gernsback had understood that 'magazine fiction and science fiction arose at the same time and were allowed to develop together', that there was a correlation between the emergences of form and content.[24] The first chapter of Ashley's *The Time Machines* explores this correlation in depth, concluding that *Amazing*'s 'appearance was neither sudden nor a surprise, but the inevitable result of years of development of science fiction in the popular magazines' (p. 44). Sam Moskowitz's *Science Fiction by Gaslight* argues that a 'golden age' in pre-*Amazing* science fiction was precipitated by the availability of 'mass-circulation, quality middle-class general' magazines in the 1890s and 1900s.[25] But though science fiction thrived in those general magazines, it did so only alongside a wealth of other content, some of it by the same authors, and it is often difficult to definitively extract a science fiction text from these surroundings. With no clear signalling mechanism in place either within or between magazines, what demarcated science fiction from a ghost story, an adventure tale, a society romance, or detective fiction? More troublingly, how could it be distinguished from the miscellaneous non-fictional, editorial, and paratextual contents which, alongside fiction, constituted the general magazine?

This was the challenge which *Amazing* answered. By offering a periodical rather than a formal definition of science fiction, it segregated a single strand of the magazine's history for literary and commercial development. This fact goes some way towards explaining not only why it took until the late 1920s for the term 'science fiction' to appear (print technology and size of potential readership being important factors in the emergence of niche periodicals), but also the ease with which we now apply that term to the work of authors writing much earlier, authors who would likely have had difficulty identifying themselves or their writing either with each other or with Gernsback's stated project. Addressing the anachronism inherent in referring to these authors and works as anything approaching a coherent group, Mark Bould and Sherryl Vint make the point that:

[24] Mike Ashley, *The Time Machines: The Story of the Science-Fiction Pulp Magazines from the Beginning to 1950* (Liverpool: Liverpool University Press, 2000), p. 4.
[25] *Science Fiction by Gaslight: A History and Anthology of Science Fiction in the Popular Magazines, 1891-1911*, ed. by Sam Moskowitz (Westport, CT: Hyperion Press, 1968), p. 11.

> Such fiction could only retrospectively become SF once the idea of the genre was established, while the idea of the genre could only come into being because such fiction existed.[26]

Bould and Vint evoke Bruno Latour's notion of 'translation', seeing science fiction (which I, too, will call 'sf' hereafter[27]) 'as an ongoing process rather than a fixed entity' and examining it 'in terms of shifting, rhizomatic networks of connection and the building of collectives'.[28] Gernsback's articulation of sf bears similarities to Latour's image of Pasteur working in his laboratory, his germ theory outpacing Pouchet's spontaneous generation not because of its greater insight but because it is able to form the most numerous and convincing connections between a series of actants, both human and non-human.[29] Like Pasteur, Gernsback forms an assembly of actants sufficiently persuasive that the model is eventually held to be true even of the time before it was propounded.[30]

Latour's ideas underpin much of this thesis, and I shall return to them presently. For the time being, the key notion which I want to take from him is 'enrolment', a term describing the work done by human and non-human actants in the composition of scientific facts. Bould and Vint argue that this notion can equally be used to understand the creation of popular literary genres, sf in particular.[31] Seen this way, Gernsback's publishing enterprise depended on the enrolment of temporally and stylistically dissimilar authors into his unitary project.[32] But Latour also stresses that it takes groups of actants working together (deliberately or otherwise) in order to create new assemblages – the articulation of sf was not Gernsback's work alone, and in fact he lost control of the genre to other financial and imaginative actants almost immediately.[33] To most present-day critics, Gernsback's idea of sf, particularly the didactic element which he

[26] Mark Bould and Sherryl Vint, *The Routledge Concise History of Science Fiction* (London: Routledge, 2011), p. 2.
[27] Standards on whether the abbreviation should be capitalised vary: I follow *The Encyclopedia of Science Fiction*'s decision to render it in lower case.
[28] Bould and Vint, *Concise History of Science Fiction*, pp. x & 4.
[29] Bruno Latour, *The Pasteurization of France*, trans. by Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1988). See also Bould and Vint, pp. 4–5.
[30] For the temporal side of this argument, see Latour, *Pandora's Hope*, p. 171. I return to the subject in chapter 2 of this thesis.
[31] Mark Bould and Sherryl Vint, 'Learning from the Little Engines That Couldn't: Transported by Gernsback, Wells and Latour', *Science Fiction Studies*, 33 (2006), 129–48.
[32] 'By "scientifiction" I mean the Jules Verne, H. G. Wells, and Edgar Allan Poe type of story' (Gernsback, p. 3). The disparities between Poe, Verne, and Wells are explored in depth in Bould and Vint, *Concise History of Science Fiction*, pp. 6–16.
[33] Ashley, 'Science Fiction Magazines', pp. 63–64.

assumed to be at its core, is antiquated; discussion on the extent, nature, and value of his influence is ongoing.[34] Because Latour also insists that nonhuman as well as human actants have agency in these assemblages, my readings also understand the magazine as *active* in the composition of sf, an enabling format as well as a source of *a priori* material.

Readers have, on the whole, lost the sense of the magazine's importance in sf's history.[35] There are a number of possible reasons for this, from the ephemeral status of magazines as opposed to books, through sf criticism's frequent desire to disassociate itself from the demotic fiction of the pulps, to the oppositional twentieth-century construction of 'literature' which de-emphasises periodicals and is Laurel Brake's topic in *Subjugated Knowledges*.[36] However, our diminished appreciation of the magazine as a format for early sf is also part of Gernsback's success in making the genre something now widely perceived as an *innate* category of fiction. By its ephemerality, the periodical collaborates with enrolment by de-emphasising, after the event, the work done.[37] Each issue of a magazine is superseded by its successor, but printed volumes are designed to endure over time, carrying with them the impression of an immutable pre-existing genre.[38] Today, sf has its own dedicated publishers, shelves in bookshops, and academic journals. Our tendency is to think of it as essential rather than composed. When we do this, to adapt Gillian Beer's synopsis of Darwin's impact on culture, we pay Gernsback the homage of our assumptions.[39] The idea of a building provides a useful analogy for this: more obviously a whole, discrete object with the scaffolding removed, it is nonetheless easier to

[34] See, for instance, Gary Westfahl and R. D. Mullen, 'An Exchange: Hugo Gernsback and His Impact on Modern Science Fiction', *Science Fiction Studies*, 21 (1994), 273–83.
[35] 'Unfortunately today the very existence of the SF magazine is largely unknown to the vast science fiction market' (Ashley, 'Science Fiction Magazines', p. 60).
[36] Laurel Brake, *Subjugated Knowledges: Journalism, Gender and Literature in the Nineteenth Century* (Basingstoke: Macmillan, 1994), p. xi.
[37] I dwell at greater length on the implications this has on sf in chapter 2.
[38] Throughout this thesis, I use 'genre' to refer to sub-sections of 'mass publication that came to include science fiction alongside the detective story, the modern romance, the Western, horror, fantasy, and other similar genres, and which collectively comprised a practice of genre categorization distinct from and in tension with the pre-existing classical and academic genre system that includes the epic, tragedy, comedy, satire, romance, the lyric, and so on' (John Rieder, 'On Defining SF, or Not: Genre Theory, SF, and History', *Science Fiction Studies*, 37 (2010), 191–209 (p. 199)). In other words, I focus on 'popular' genre, 'genre' understood as a strand of, or process within, popular fiction. For more on genre as an evolving term, see John Frow, *Genre* (London: Routledge, 2006), pp. 1–2; Rick Altman, *Film/Genre* (London: BFI, 1999), pp. 11–12.
[39] Beer, *Darwin's Plots*, p. 2.

investigate details of its construction (and to remember that it is, after all, constructed) if the scaffolding is still there.[40]

It is very important to note that the consequences of our assumptions are far from esoteric. Considered broadly, sf is now an industry spanning a range of media from literature to video games to fine art, subversive niche practitioners to Hollywood blockbusters, and one which has provided livelihoods for generations of artists, writers, and directors (and, of course, publishers, producers, and executives). Gollancz's *Encyclopedia of Science Fiction* is now published online, since few bookshelves (or purses) could support its 3.5 million words.[41] Like all genres, sf exists *because* we assume it does: opinions vary widely as to how it should be defined, but it would be impossible to deny that the endeavour to define it has had numerous tangible, real-world consequences.

Many of these consequences are of course positive, and sf's discrete existence and dedicated readership have allowed the genre to progress in directions presumably unthinkable to the *fin de siècle* writers who played a role in its inception. At the same time, though, delineation brings with it a kind of myopia: the more dedicated a readership is to sf *per se*, the more polarised it becomes against discourses seen as distinct, oppositional, hostile. Delineation, in other words, can isolate as well as unify. 'The sense that sf has been ignored, ridiculed or undervalued', says Luckhurst, 'contributes to the sense of wounded hurt often expressed by readers and writers on the genre'.[42] This sense of hurt often turns inwards, causing a further fragmentation into sub-genres and sub-sub-genres, 'repeated attempts to carve out a "respectable" canon (whether chosen by aesthetic, national, political, formal, or other criteria) by dumping vitriol on the rest of the genre' (pp. 9-10). Internal fragmentations can follow practices of consumption as well as production: Gary K. Wolfe, for instance, worries about 'the potential balkanization of sf studies, with academics listening only to other academics, writers to other writers, fans to other fans'.[43]

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[40] John Rieder quoting Geoffrey Bowker and Susan Leigh Star: 'Full-fledged membership in [a community of practice such as sf] involves the naturalization of its objects of practice, which "means stripping away the contingencies of an object's creation and its situated nature. A naturalized object has lost its anthropological strangeness"' (Rieder, 'On Defining SF', p. 203).
[41] 'Notes in May', *Science Fiction Encyclopedia*, 2012 <http://www.sf-encyclopedia.com/news/notes-in-may/> [accessed 26 May 2012].
[42] Luckhurst, *Science Fiction*, p. 9.
[43] Brian W. Aldiss and others, 'Roundtable on SF Criticism', *Science Fiction Studies*, 33 (2006), 389–404 (p. 403).

Referring to sf here as a coherent genre, and its writers and readers as a coherent (and distinct) group of people, is, of course, reductive – but that is what dyadic division encourages, the creation and opposition of only partially sustainable generalisations. Hanging on to these generalisations has required us to lose the sense of fecundity which permeates the periodical world from which Gernsback drew his source material. Moskowitz explicitly correlates the rise of sf with the success of the general magazine in the *fin de siècle*:[44] Luckhurst, meanwhile, argues that

> …it makes little sense to talk about 'science fiction' before 1880, and even then critical work has to be acutely aware of the complex, overlapping forms of popular literary culture that exist in the forty or so years before distinctive SF genre publishing begins in the 1920s.[45]

Those 'complex, overlapping forms' are the subject of this thesis. One of the crucial ways in which they overlapped was by appearing in the same magazines, and though Luckhurst does draw attention to the importance of the periodical for sf in the *fin de siècle*, his genre study focuses on single authors (particularly H. G. Wells in this period) rather than on the publishing environment *per se* (p. 17). By contrast, I focus primarily on the magazines themselves – their sf content, their avowedly non-fictional content, and the significant amount of material which falls, tantalisingly, somewhere in between.

I have so far presented several ways in which magazines were closely involved with *fin de siècle* sf: they provided material for the first articulated sf corpus; they were the dialogic basis for nurturing a community of readers (and eventually a wider publishing industry); they were a formal means of establishing (and, later, policing) a literary territory based on inclusion and exclusion; and their ephemerality lead to the slow occlusion of those territorial negotiations over time, leaving the impression of an essential, innate genre. For all of these reasons, studying magazines is important if we wish to understand the historical processes by which sf came into existence. But the magazines, as I have already hinted, challenge the definition process as well as aiding it – and it is to this aspect of them that I now wish to turn.

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[44] Moskowitz, p. 11.
[45] Luckhurst, *Science Fiction*, p. 16.

Sf developed to the point where Gernsback could begin to articulate it precisely because the periodical was a hybrid space in which numerous textual forms could flourish. We can see this commitment to many-voicedness not only in the general magazines' format, circulation, and breadth of content, but also explicitly in some of their prose. Here, for instance, is Robert Barr, in a profile of Mark Twain published in the *Idler* magazine in 1898:

> The world loves a label. It likes to classify its men and things, docket them, and arrange them nicely on its shelves, each in the proper place. […] [M]an has become a labelling animal, so inured to the vice that he carries it into provinces where it does not legitimately belong.[46]

Or take W. T. Stead, who in 1891 called the monthly magazine 'the latest and most radical form of the democratisation of speculation':

> It is there where the modern thinker finds the most accessible rostrum from which to address his fellows; there also the contending disputant finds the most congenial area for the display of his capacity. Thus the monthly review has become the forum of civilisation.[47]

Contradictions are important here. Barr's rejection of labels for Mark Twain's writing prefaces an argument in which he harmonises them all into one category, albeit a fairly broad one: 'books which, aside from their general interest, cause a man to think'.[48] Stead, in the same piece in which he praises the press's many-voicedness, worries that 'the very multiplicity of magazines tends to diminish their usefulness'.[49] Stead's solution, the *Review of Reviews* and its attendant *Annual Index of Periodicals*, did more visible work towards the systematisation of magazines than any other single publication in the *fin de siècle*. Both Barr and Stead were editors as well as journalists: they were both authors, too, and each dabbled in sf more than once.[50] This collection of seemingly contrary opinions on

[46] Robert Barr, 'Samuel L. Clemens, "Mark Twain"', *The Idler*, 8 (February 1898), 22–29 (p. 23).
[47] W. T. Stead, 'Preface', in *The Annual Index of Periodicals & Photographs for 1890* (London: Review of Reviews, 1891), p. iii–iv (p. iii).
[48] Barr, 'Samuel L. Clemens', p. 25.
[49] Stead, 'Preface' (1891), p. iii.
[50] Barr authored, for instance 'Within an Ace of the End of the World' (*Windsor Magazine*, December 1900), an apocalyptic near-future tale of an earth laid waste by the side-effects of a scientific endeavour to produce an unlimited source of food out of the air. Stead's 'In Our Midst' (published as a *Review of Reviews* annual in 1903) tells of an undiscovered matriarchal

and activities in the periodical press brings us to the final (and perhaps most important) characteristic which makes its relationship to sf so vital:[51] its ability to hold apparently irreconcilable opposites in suspension.

Sf, like the magazine, thrives on the simultaneous existence of mutually exclusive ideas. The futures, pasts, and presents proposed by various sf tales generally contradict one another: to be a reader of the genre is to be able, even more so than readers of other fiction, to negotiate such contradictions, moving without pause between worlds with different rules, different histories. For example, between January 1903 and June 1904, *Pearson's Magazine* ran six stories by Fred M. White, each forecasting a different disaster for London: blizzards, toxic fog, plague, financial collapse, explosions in the underground, and drought.[52] It is unlikely that these stories are meant to function as a sequence, describing one (extremely unlucky) city – they don't share characters or mention each other's events, and disasters are reported from different perspectives in each story: two fraudsters, a newspaperman, a pair of nobles, and so on. Rather than a coherent future world, these tales present a series of contingencies, one identifiable goal being to stir readers into preventative real-world action.[53] In this often heavy-handed desire to effect social change, White's tales resemble utopian works such as Edward Bellamy's *Looking Backward: 2000-1887* (1888), which had a galvanising effect on socialism on both sides of the Atlantic throughout the *fin de siècle*. The series also knowingly follows numerous other magazine forecasts of the capital's destruction, such as Grant Allen's 'The Thames Valley Catastrophe' (*Strand*, December 1897) and Robert Barr's own 'The Doom of London' (*Idler*, November 1892). Utopian and disaster fiction had yet to fall under the umbrella term 'science fiction'; White is participating in the gradual

civilisation in central Africa who send an emissary to London to report back on British society.

[51] Amongst OED's definitions of 'vital': 'Maintaining, supporting, or sustaining life'; 'Paramount, supreme, very great'; 'Conferring or imparting life or vigour'; 'Of parts, organs, etc.: Essential or necessary to life'; 'Of places: Full of life or activity' ('Vital, Adj. and N.', *OED Online* (Oxford: Oxford University Press, 2012) <http://oed.com/view/Entry/224020> [accessed 27 May 2012]).

[52] Fred M. White, 'The Four White Days', *Pearson's Magazine*, 15 (January 1903), 102–13; Fred M. White, 'The Four Days' Night', *Pearson's Magazine*, 15 (February 1903), 166–78; Fred M. White, 'The Dust of Death', *Pearson's Magazine*, 15 (April 1903), 416–25; Fred M. White, 'A Bubble Burst', *Pearson's Magazine*, 15 (May 1903), 554–64; Fred M. White, 'The Invisible Force', *Pearson's Magazine*, 15 (June 1903), 653–64; Fred M. White, 'The River of Death', *Pearson's Magazine*, 17 (June 1904), 612–25.

[53] E.g. 'The knowledge a century hence that London derived its water supply from an open river into which many towns conveyed its sewage will be recorded with pitiful amazement' (Fred M. White, 'River of Death', p. 619).

process of bringing them closer together. But there are also undoubted benefits from the tales' association (both in the range of voices they adopt internally and their external connection to non-fictional items in the same magazines) with genres which would never be subsumed into sf. 'A Bubble Burst', for instance, contains no sf-like characteristics at all, and could be considered sf only via its associations with the other tales, associations derived entirely from their joint, periodical appearance. White's stories, then, resist retrospective acts of classification by the same acts of minor contradiction – internal and external – which hold them so profitably between discourses for their contemporary readers. The magazine is not only the enabling format for this process, but also directly profits from it, since the contradictions between each of White's stories maintain each issue's independence from the next whilst still keeping them linked.[54] The tales can be approached in any order, with or without knowledge of the existence or specific contents of their predecessors – a fact extremely compatible with the commercial model of the general magazines, which sought to make every issue equally accessible for new readers, as little reliant as possible on knowledge of the contents of previous numbers.[55] Publishing sf also increased the range of stories the magazine could offer, their variety part of the strategy by which regular readers were encouraged to repeat their custom.[56] In other words, the magazine was active and interested in the processes which prefigured the emergence of sf: I contend throughout what follows that the relationship between form and content was far more reciprocal than would be

[54] For more on the point that 'as the definition of the work depends on the material artefacts that document it, the identity of the work changes with the publication of every issue', see Mussell, *The Nineteenth-Century Press in the Digital Age*, p. 10.

[55] A particular innovation of Herbert Greenhough Smith, working on the *Strand* under George Newnes. See Ashley, *The Age of the Storytellers*, pp. 196–97.

[56] As an example of the scope typically exhibited by one of these publications, here is a précis of the April 1903 issue of *Pearson's* (vol. 15), selected more or less arbitrarily because it contains one of the White stories currently under discussion. It also contains: a selection of reproduced paintings of cats and dogs ('The Art of the Age'); a spy thriller story based on real-life world political events; an article about bird migration patterns; a sermon from the Rev. Canon Fleming on 'The Problem of Inebrity'; a comic tale of financial misfortune; part three in the serialized memoirs of a prisoner in the British penal system; a supernaturally-edged story about wife murder; an article on the spoken language of monkeys; a daily physical fitness regime; a selection of autobiographical vignettes by an American bandmaster; a New Woman romance story set in a science college; and the latest in Vivian Carter's series of satirical pieces recommending various social and technological reforms (on this particular occasion: government politeness, magic lanterns instead of mirrors at barbers' shops, official photographs of celebrities, and a wireless signalling system to attract the attention of waiters). That this variability is such a constant is, perhaps, what ensures that no part of it jars with any other or seems to 'not fit'.

implied simply by stating that sf thrived because it had found an apposite media in which to appear.

That reciprocity is at the heart of why studying general-magazine sf is an effective way of challenging the labelling process. In the way literary genres, modes of writing, different registers of fact and fiction appear alongside one another other in periodicals, apparently unproblematically, we can read alternatives as well as predecessors to the exclusionary discourses of Gernsback and his inheritors. 'Challenging the labelling process' in this context doesn't mean denying or seeking the destruction of categories which have now been firmly established by decades of enrolment, nor is it an attempt to return to a perceived 'golden age' of unitary discourse (the self-contradictions of both early sf and the magazines in which it appears would make a nonsense of such an endeavour). There is a difference, Latour stresses, between calling something fabricated and non-existent; a chair is fabricated, but you can still sit on it.[57] By drawing attention to the fabricated nature of sf as a category, my agenda is simply to mollify the exclusionary discourses which arise from the assumption of rigid *a priori* definitions.

Sf is a particularly good case study for exploring generic distinctions because it has become almost defined by its indefinability. The eighty-six years since Gernsback launched *Amazing Stories* have seen a significant amount of critical energy expended in trying to make sf adhere to an absolute definition, an undertaking which it would not be unfair to describe as a central goal of academic sf criticism.[58] Brian W. Aldiss goes so far as to cast sf *itself* as a 'search for a definition', co-opting the genre's practitioners as well as its critics into the taxonomic endeavour which Robert Barr would have found so tasteless.[59] This enterprise is not one in which I propose to participate. Insofar as a working definition is required in order to identify science fiction in the *fin de siècle* periodical press, I follow Paul Kincaid in his assertion that though no formal

[57] Latour, *Pandora's Hope*, pp. 114–15.
[58] E.g. 'Disputes continue about the origins of the genre which have been traced as far back as Lucian and Plato; and it is even debatable whether it should be thought of as a single genre rather than as a series of subgenres…' (David Seed, 'Preface', in *Anticipations: Essays on Early Science Fiction and its Precursors* (Liverpool: Liverpool University Press, 1995), p. ix–xvi (p. ix)). 'Strictly applied, every single one of [Gary K. Wolfe's thirty-three definitions of sf] would admit to the genre works that we would prefer to exclude, or would omit works we feel belong in the genre' (Paul Kincaid, 'On the Origins of Genre', *Extrapolation*, 44 (2003), 409–19 (pp. 409–10)). For more on definitions, see Stableford, Clute and Nicholls, 'Definitions of SF'.
[59] Brian W. Aldiss, *Billion Year Spree* (London: Corgi Books, 1973), p. 8.

attempt 'has successfully managed to encompass all that [sf] is, all that it has been, and all that it might be', it is nonetheless possible to identify a specific text as sf by substituting the notion of 'family resemblances' (which he borrows from Wittgenstein) for a rigorous, catch-all definition.[60] Kincaid's argument is a persuasive and theorized refinement of Damon Knight's 1956 proclamation that 'science fiction is "what we point to when we say it"' (p. 411). Discussing Kincaid, John Rieder makes the point explicitly as it applies to the study of early sf:

> Studying the beginnings of the genre is not at all a matter of finding its points of origin but rather of observing an accretion of repetitions, echoes, imitations, allusions, identifications, and distinctions that testifies to an emerging sense of a conventional web of resemblances.[61]

My interest in this thesis, therefore, is less in identifying whether or not a given story or article 'is' or 'isn't' an example of early science fiction. What concerns me is tracing some of Kincaid's 'family resemblances' into areas where they have been occluded by later processes of definition, uncovering 'repetitions, echoes, imitations, allusions, identifications, and distinctions' which might previously have been left by the wayside.[62] Examples could include news reporting which deploys sf-like metaphors or speculations, citizen journalism with a science-fictional overtone, or popular science articles which treat of their subjects with the aid of narrative or fictional architecture (a striking example of the latter is the focus of my first chapter). Inevitably, subjective processes are at work which effect what I will call 'science fiction' and what I will not, but as Bould and Vint write, individual analysis is less important than

> …producing a history that enables a better understanding of the ways in which SF exists as a fuzzily-edged, multidimensional and constantly shifting discursive object.[63]

[60] Kincaid, p. 414.
[61] Rieder, 'On Defining SF', p. 196.
[62] 'Definitions are to assist, not overpower, thinking' (Aldiss, p. 9). A central claim of my thesis might be expressed in the argument that this statement is naïve.
[63] Bould and Vint, *Concise History of Science Fiction*, p. 5.

The fuzzy edge, rather than early sf *per se*, is my subject. By treating the magazine as a contact zone between many different types of writing – and between writings which it would be difficult to place in many present-day typologies – my objective is to expose the processes at work in the act of definition. Sf's notional location in the borderland between literature and science, a borderland also in the process of being composed in the *fin de siècle*, helps track these findings back to the larger and far more consequential division with which I began. The next section constitutes an argument for considering early sf in the magazines in terms of the study of the intersection between literature and science.

II. Science, Fiction

The relative dispositions of literature and science at the *fin de siècle* are now most famously represented by the debate about the future of education between Matthew Arnold and Thomas Huxley in the early 1880s.[64] The amicable tone of this debate, and the pains its belligerents go to in order to reassure their audiences that they respect one another,[65] testify to the fact that 'the protean quality of Victorian science persisted even as the professional characteristics with which we are familiar today became slowly established'.[66] The Victorian academy was professionalizing rather than professionalized, and it's the sense that the two sides are still able to communicate which so markedly separates the Huxley/Arnold discussion from that which has superseded it in infamy, the 'Two Cultures' debate of the 1960s.

[64] The debate and some of its implications are explored in David Amigoni, 'Imitation of Life: Science, Literature and the Dissemination of Culture', in *Transactions and Encounters: Science and Culture in the Nineteenth Century*, ed. by Roger Luckhurst and Josephine McDonagh (Manchester: Manchester University Press, 2002), pp. 96–116 (pp. 97–98 &c.).
[65] Huxley: 'I am the last person to question the importance of genuine literary education, or to suppose that intellectual culture can be complete without it' (T. H. Huxley, 'Science and Culture', in *Science and Education: Essays* (London: Macmillan & Co., 1893), pp. 134–59 (p. 153)). Arnold: 'All knowledge is interesting to a wise man, and the knowledge of nature is interesting to all men' (Matthew Arnold, 'Literature and Science', in *Philistinism in England and America*, ed. by R. H. Super, The Complete Prose Works of Matthew Arnold (Ann Arbor, MI: University of Michigan Press, 1974), 53–73 (p. 60)). Stefan Collini describes the exchange as 'notably amicable' (Collini, 'Introduction', p. xvi).
[66] Bernard Lightman, 'Introduction', in *Victorian Science in Context*, ed. by Bernard Lightman (Chicago: University of Chicago Press, 1997), pp. 1–12 (p. 10).

No discussion of the relationship between literature and science is complete without an opening reference to C. P. Snow's 1959 Rede lecture, whose title has become a shorthand for the idea that the two constitute monolithic and mutually opposed institutions between whom communication is impossible. Snow's lecture is actually far more nuanced,[67] but the fact that both it and its author have taken on this paradigmatic association suggests that there is something resonant about the simpler idea: Snow himself saw the lecture as an articulation of something which was already 'in the air'.[68] Indeed, his argument has a lot in common with Huxley's, and F. R. Leavis's vitriolic 1963 response – also a lecture – can be crudely mapped onto Arnold's position. The main difference is in the invective: Leavis, whose subtitle is 'The Significance of C. P. Snow', is alarmingly ad hominem,[69] and whilst Snow masterfully refused to respond in kind,[70] the conciliatory tone of 'The Two Cultures' is now generally overlooked. What has survived into academia's zeitgeist – as suggested by the fact that the affair is sometimes referred to as the 'Snow-Leavis controversy' – is a fight.

Studies in Literature and Science often quote the 'Two Cultures' idea in order to refute it, to draw attention to contact zones between literature and science and begin an argument that the two are much more mutually involved than the cliché suggests. Whilst this thesis will implicitly contribute to these endeavours, I want to make a slightly different point here, which is that the very existence of the cliché is an indication that it *is* in fact, in some respects, pertinent. The fabricated chair can still be sat on: just as decades of assuming the existence of sf have resulted in an indisputable economic reality, the literature/science opposition has, in the words of Roger Luckhurst and Josephine McDonagh,

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[67] For example, the 'literature' with which Snow opposes 'science' is perhaps better referred to as 'modernism' – recent literary work which Snow saw as antiscientific. Whilst I do not agree with this claim (many excellent accounts of modernism's engagement with science include Michael Whitworth, *Einstein's Wake* (Oxford: Oxford University Press, 2001)), it is very different from the one with which Snow is typically associated.

[68] C. P. Snow, *The Two Cultures*, ed. by Stefan Collini (Cambridge: Cambridge University Press, 1998), p. 54.

[69] E.g. 'Snow is, of course, a – no, I can't say that; he isn't: Snow thinks of himself as a novelist. I don't want to discuss that aspect of him, but I can't avoid saying something', &c. &c. (F. R. Leavis, *Two Cultures? The Significance of C. P. Snow* (London: Chatto & Windus, 1962), p. 12).

[70] 'Such a reply is not on. It puts one in the same psychological compartment as one's traducer. That is a condition from which one has a right to be excused' (Snow, pp. 57–58).

> …shaped many aspects of modern society, from the organisation of the university to the development of the humanities as a 'civilising' force, the state's funding of the arts and the emergence of popular ecology movements.[71]

Regardless of what Snow meant to say in 1959, and regardless of how justifiable it is to oppose literature and science in the abstract, it now seems useless to deny that such a thing as the two culture divide is currently active in education, if only because so many scholars believe it to exist and have been working under the assumption of its existence for so many decades. Like sf, then, the literature/science division is a consequence of enrolment – a highly artificial assemblage of actants past and present that is nevertheless powerfully real.[72] To put it another way, there is the two cultures problem and the 'two cultures' problem; the notional separation of literature and science (Snow's subject) and the passive assumption of that separation which causes it to re-inscribe itself (his consequence). These problems can no longer be usefully disentangled.

The Huxley/Arnold debate, seen after the retrospective work of enrolment, now looks like a prelude to the two cultures discussion, one in which the boundaries were less fixed, still emerging, easier to cross. In fact, there are significant objections to this conception, and Paul White has demonstrated that the two men, far from being opposed, were actually involved in a mutual project of educational reform – subsequent 'two cultures' battles have polarized and generalized this nuanced critical exchange.[73] In both narratives, though, there remains enough disagreement between the two men to make a nonsense of any attempt to locate a unitary culture in the late-Victorian period, or to argue that before the twentieth century there was no such thing as divided knowledge.[74]

[71] Roger Luckhurst and Josephine McDonagh, 'Encountering Science', in *Transactions and Encounters: Science and Culture in the Nineteenth Century*, ed. by Roger Luckhurst and Josephine McDonagh (Manchester: Manchester University Press, 2002), pp. 1–15 (p. 2).
[72] 'Our textbooks teach us very early on to separate those who study the humanities from those who manipulate slide rules, those who work with letters and texts from those who use numbers, those concerned with interpersonal relations from those concerned with the physical world' (Josué Harari and David F. Bell, 'Journal á Plusieurs Voies', in Michel Serres, *Hermes: Literature, Science, Philosophy*, ed. by Josué Harari and David F. Bell (Baltimore, MD: Johns Hopkins University Press, 1982), p. ix–xl (p. xi–xii)).
[73] Paul White, 'Ministers of Culture: Arnold, Huxley and Liberal Anglican Reform of Learning', *History of Science*, 43 (2005), 115–38.
[74] For further refutation of the 'One Culture' notion, see Dawson, 'Literature and Science', p. 311. Whilst it is beyond the remit of this thesis to comment at length on the search for the chimerical 'One Culture' in periods earlier than the *fin de siècle*, there is a suggestive similarity between our apparent need to find it somewhere – anywhere – and our apparent need to pin down a definition of sf. Following Kincaid's argument that the search for a definition of sf is ultimately

White suggestively locates the unity of Huxley and Arnold precisely in their disagreements, a characteristic which this thesis finds in the magazines time and time again.[75] George Levine, meanwhile, has written:

> I want to assert baldly that even if, when pressed, we cannot adequately define either science or literature, common sense tells us that science isn't literature.[76]

Like all appeals to common sense, Levine's asks us to overlook a large body of evidence – in a liberal interpretation of this quotation, any scientific practice of which writing was a component (ie. all of it). But the eschewal of a formal definition, which parallels Damon Knight's claim that sf is 'what we point to when we say it' is key in understanding that Levine is not making a claim for opposite and incommensurate practices so much as he is rejecting as unhelpful (and, I would add, impossible) the notion of dissolving categories completely. In approaching sf from the perspective of Literature and Science, I suggest that Gillian Beer's 'two way traffic' notion, which has proven so successful in demonstrating correspondences between the two cultures without placing either in a dominant position, might also be usefully applied to the emergence of a genre of popular literature.[77] In other words, I propose that the categorisations of fiction and education as they emerge in *fin de siècle* magazines are closely analogous, and have the potential to illuminate each other. Paul Fayter comes close to making this analogy in an essay about 'Late Victorian Science and Science Fiction':

> Professional scientists not only helped shape science fiction, in many cases their work was shaped by it. […] If we pay attention to the content and diverse cultural locations of both science and science fiction, to who was writing it and who was reading it, we will notice a fluid exchange of ideas – not only across national and disciplinary boundaries, but across lines traditionally

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inextricable from the search for the 'first' sf text (Kincaid, p. 409), it is tempting to think that both quests are evidence of our appetite for the origin story.

[75] Paul White, p. 116.

[76] George Levine, 'Why Science Isn't Literature: The Importance of Differences', in *Realism, Ethics and Secularism: Essays on Victorian Literature and Science* (Cambridge: Cambridge University Press, 2008), pp. 165–81 (p. 167).

[77] Beer, *Darwin's Plots*, pp. 5 &c.

> separating amateur and professional, highbrow and lowbrow, established knowledge and speculation, science and fiction.[78]

This passage makes an implicit argument for attention to be paid to the 'lowbrow' when contemplating the separation of knowledge. Yet despite its interest in the exchange of ideas across boundaries, Literature and Science has, for the most part, remained cautiously distant from both sf and popular fiction more generally.[79] There are a number of possible reasons for this. Literature and Science is a relatively young field of enquiry, and it may be felt that a focus on canonical figures is necessary to reinforce its legitimacy as a scholarly approach.[80] Equally, sf criticism is more established,[81] and academics in Literature and Science might feel that in taking sf as their subject they would be repeating work or treading on toes. Both of these objections themselves make assumptions about the essential qualities of boundaries – between 'high' and 'low' literature, between various schools of literary criticism. This project, however, is explicitly *about* those boundaries. It is because so many of them – high/low, sf/fiction, academy/public, literature/science – intersect at a point near emergence in *fin de siècle* sf that it becomes an excellent object of study.

Once again, Latour's model, with its 'desire to shake up the fixed grids of disciplines', is useful here.[82] Whilst Latour himself seldom addresses sf head-on, preferring to concern himself with 'science studies' (he is perhaps more famously identified with the sociology of science), convincing arguments for

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[78] Paul Fayter, 'Strange New Worlds of Space and Time: Late Victorian Science and Science Fiction', in *Victorian Science in Context*, ed. by Bernard Lightman (Chicago: University of Chicago Press, 1997), pp. 256–80 (p. 257).

[79] Popular *science*, on the other hand, has been addressed far more thoroughly. See, for instance, *Science in the Marketplace: Nineteenth-Century Sites and Experiences*, ed. by Aileen Fyfe and Bernard Lightman (Chicago: University of Chicago Press, 2007).

[80] At least in Britain, the question of what Literature and Science 'is' – a field? a method? an 'inter-discipline'? – continues to be a vexed one, and referring to it (as I do in this paragraph) as a coherent body of scholarship is inevitably to generalize a complex and continuing discussion. This project, which has issues of categorisation and definition at its heart, draws a great deal of strength from the vagueness of Literature and Science as it stands, and I would be no happier applying a formal definition to it than I would to sf.

[81] The major critical map of sf is provided by Neil Barron, *Anatomy of Wonder: A Critical Guide to Science Fiction*, 5th edn (Westport, CT: Libraries Unlimited, 2004). Other major synoptic volumes are *A Companion to Science Fiction*, ed. by David Seed (Malden, MA: Blackwell Publishing, 2008) and *The Cambridge Companion to Science Fiction*, ed. by Edward James and Farah Mendlesohn (Cambridge: Cambridge University Press, 2003). The major journals in this field are *Science Fiction Studies* (DePauw University), *Extrapolation* (Liverpool University Press), and *Foundation* (The Science Fiction Foundation).

[82] Roger Luckhurst, 'Bruno Latour's Scientifiction: Networks, Assemblages, and Tangled Objects', *Science Fiction Studies*, 33 (2006), 4–17 (p. 4).

applying his ideas to the genre's writing have been made by Luckhurst, Mark Bould, and Sherryl Vint.[83] Despite these, Latour has never quite been taken into the mainstream of either sf criticism or work on Literature and Science – a function, perhaps, of the fact that his work is primarily focussed on the boundaries themselves, and the act of calling them into question.

It is important to distinguish this critical interrogation of boundaries from an attempt to deny the validity of specialisation. As Stefan Collini points out in the introduction to his edition of Snow's lecture, '[i]t is fruitless to lament the process of specialisation as such: it is the precondition of intellectual progress, and often represents an impressive refinement of concepts and techniques'.[84] Specialisation has powered staggering developments in scholarship over the last century, not only in the sciences, where the rapidity of change is more immediately visible, but in the rise, for instance, of literary theory, which has deeply enriched the academic production and consumption of texts. However unitary culture might have been in the *fin de siècle*, or the late-eighteenth century, or at whichever point you'd choose to wind the clock back to, it did not produce the life expectancy, communication technology, ease of access to books and ideas, or many other refinements of the post-Enlightenment ideal of the sciences and humanities from which we currently benefit. Or rather, it *did* produce them, precisely by fragmenting, by specialising, by admitting that the total of what there was to know far exceeds the learning capacity of any one living person (and continues to grow, thanks to the collective efforts of all). This is not a process which it would be feasible, or sensible, to reverse.[85]

Having admitted these positive consequences of specialisation, though, this thesis will focus on the negative: on isolationism, infighting, and the damage to the ideal of which the university is supposedly in service.[86] Specialisation has the potential to threaten mutual understanding, the ability to communicate across

[83] The latter two in Bould and Vint, 'Learning from the Little Engines'.
[84] Collini, 'Introduction', p. lvi.
[85] In making claims like this, especially as part of an attempt to expose the anachronistic work of enrolment, it is important to be wary of presentism, and to avoid unconsciously judging late-Victorian Britain by twenty-first century standards. Nevertheless, this thesis is written under the assumption that there have been many unequivocally positive developments since 1891, least contentiously in medicine, engineering, suffrage and access to knowledge. It is not my position that present society has perfected itself in any of these areas, but it seems safe to assert that there has been objective improvement in which specialisation has played a key role.
[86] For the latter, see Terry Eagleton, 'The Death of Universities', *The Guardian* <http://www.guardian.co.uk/commentisfree/2010/dec/17/death-universities-malaise-tuition-fees> [accessed 27 August 2012].

the gaps it imposes. Its territorial metaphors often closely and troublingly resemble the discourses of colonialism. It encourages reductive caricature, with significant effects on exterior perception. Throughout what follows, I pay attention to these characteristics in order to ask whether there is a way of alleviating their effects without renouncing the benefits of specialisation or making new imperial claims.[87]

Time and again, in the *fin de siècle* magazines, these various problems of communication and characterisation cluster around the contested final location of truth, be they discussions surrounding the truth-claims of science or those manifested in the critical conversations around literary realism. The literature/science division in particular is supposed to have at its heart a perceived struggle between ontological and epistemological explanations of the world, as is made clear by the exchange between Huxley and Arnold: 'The reality of natural knowledge it is, which makes the friends of physical science contrast it, as a knowledge of things, with the humanist's knowledge, which is, say they, a knowledge of words', remarks Arnold; science 'bids the learner seek for truth not among words but among things', says Huxley.[88] This dichotomy becomes problematic when taken to the pages of the periodicals, however, where an abiding concern with different aspects of fundamentally ontological questions is vividly present in both the most sober reports of scientific subjects and the most outrageous fantasies of popular fiction. When these items share central concerns as well as magazine covers, I argue in what follows, it inevitably complicates the intuitive two-culture model, opening up fresh perspectives on media approaches to the vexed question of reality.

Realism is yet another 'word that begs so many questions that it seems absurd to talk about it as though it were susceptible to a full definition'.[89] George Levine has written extensively on the Victorian preoccupation with realism, and Gillian Beer is quick to remark not only the preoccupation but its intimate relationship with the process of specialisation:

[87] Michel Serres: 'I think that the dividing up of the disciplines into very narrow cells is certainly one of the causes of the effectiveness of science. But from the point of view of truth in general we've lost a lot, and the goal of philosophy should be to try to create a synthesis, where analysis goes off into detail' (Raoul Mortley, *French Philosophers in Conversation* (London & New York: Routledge, 1991), p. 58).
[88] Arnold, 'Literature and Science', p. 60; Huxley, p. 150.
[89] George Levine, 'Literary Realism Reconsidered', in *Adventures in Realism*, ed. by Matthew Beaumont (Malden, MA: Blackwell Publishing, 2007), pp. 13–32 (p. 14).

> Darwin himself saw that taxonomies always cause trouble with boundaries […]. [He] never doubts that the world is real. But he does doubt our categories for understanding it and indeed questions, while he shares, the categorising zeal of human beings.[90]

The distinctively Victorian feeling of this anxiety[91] – discussed here in the context of the nineteenth century's most destabilising reorganisation of categories – is one possible justification of the fact that Literature and Science has always been disproportionately focussed on the Victorian era. Similarly, discussion has tended to centre on practitioners of 'high' realism, George Eliot in particular, with less attention paid to the popular writings which, I argue, drew attention to the status of reality even in the act of internally disavowing it. Writing of 'the representational gap that provides the opening for realism', Rachel Bowlby comments:

> Life may be 'like' this, but it never *is* this; the power or the pleasure of the story or image that convinces us of its lifelikeness depends on a knowledge of that difference.[92]

Sf also depends on our knowledge of the gap between its representations and our reality. Many of the early sf pieces scrutinised in this project have their roots as much in satire as in fantasy:[93] Swift is widely acknowledged as a significant influence on sf, which has been famously defined by Darko Suvin as the literature of 'cognitive estrangement', its purpose to elicit readerly contemplation of the real world by othering some of its details in the mirror of fantasy.[94] This sounds very similar to Caroline Levine's assertion that realism, rather than being (as is typically assumed) 'an epistemological faith in the appearances of things',

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[90] Beer, *Darwin's Plots*, p. xxx.
[91] '…questions about the possibility of knowing, epistemological questions, were for the Victorians urgent ones, particularly so because they were always also ethical questions…' (George Levine, 'Preface', in *Realism, Ethics and Secularism: Essays on Victorian Literature and Science* (Cambridge: Cambridge University Press, 2008), p. vi–ix (p. vi–vii)).
[92] Rachel Bowlby, 'Foreward', in *Adventures in Realism*, ed. by Matthew Beaumont (Malden, MA: Blackwell Publishing, 2007), p. xi–xviii (p. xvii). Original emphasis.
[93] For an introduction to satire's role in Victorian sf, see James G. Paradis, 'Satire and Science in Victorian Culture', in *Victorian Science in Context*, ed. by Bernard Lightman (Chicago: University of Chicago Press, 1997), pp. 143–75.
[94] Darko Suvin, *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre* (New Haven, CT: Yale University Press, 1979).

is ‘a particularly effective way to introduce readers to the activity of hypothesizing and testing in order to come to knowledge’.[95] Levine uses this definition to track a distinct high-culture trajectory of realism from Ruskin to Pater; it can also be used, though, to help explain the fact that so much early sf (and other magazine fiction of the same period) evinces an almost obsessive preoccupation with plausibility. This thesis repeatedly deals with texts which obfuscate their internal facts, cast doubt upon their own provenance, draw attention to their most ambiguous facets whilst outwardly asserting their complete believability. Why this recurring emphasis on stories which readers know to be fictitious? I suggest that these texts, whilst seldom interested in making ontological assertions about reality,[96] display by these tendencies an interest in reality just as engrossing as that of realist fiction, and just as central to its endeavours as it is to those of science.[97]

Caroline Levine parallels reading realism with performing a science experiment: both ‘test the imagination’s fertile possibilities against the evidence of the world’.[98] The abstract comparison is intriguing, but there is a need for caution here. As I have already stressed, connections between literature and science are useful as long as they do not attempt to conflate the two; despite similarities and interchanges, there are fundamental senses in which reading *Adam Bede* is not at all like working in Michael Faraday’s laboratory.[99] George Levine is at pains to stress this in his essay ‘Why Science isn't Literature: the importance of differences’, and though his title takes ‘Literature’ to mean ‘literary fiction’, the caution is still worth heeding.[100] It behoves a study of this

[95] Caroline Levine, *The Serious Pleasures of Suspense: Victorian Realism and Narrative Doubt* (Charlottesville, VA: University of Virginia Press, 2003), pp. 12 & 8. I engage with Levine’s arguments on this subject at greater length in chapter 2.
[96] Seldom, but not always – consider, for instance, the fiction of Helena Blavatsky, which was couched differently from her ‘factual’ accounts yet still sought the faith of its readers in the paranormal. Spiritualism, too, makes truth-claims which sit intriguingly with how it uses fiction: I engage with this a little further in chapters 1 and 3, although the subject as a whole would be another thesis.
[97] This is to take George Levine’s description of realism as a group of texts ‘obsessed with questions of knowledge and truth’ at its word (George Levine, ‘Preface’, p. vii).
[98] Caroline Levine, p. 5.
[99] Bould and Vint draw attention to the fact that both Gernsback and Latour, in their different conflationary visions of the two culture divide, ultimately insist on a clear demarcation between them. Bould and Vint, ‘Learning from the Little Engines’, p. 133.
[100] ‘Literature has real work to do, and that work can be best understood by recognizing the distinctiveness of literary practice, as opposed to the practice of non-fiction writers and scientists, always making overt, presumably testable truth claims’ (George Levine, ‘Why Science Isn’t Literature’, pp. 165–66).

kind to consider how best to intervene in the two culture divide (or make claims about any boundary) without claiming parity across it. It is not sufficient to rely, as E. O. Wilson does, on the ideal of consilience, since this strategy, which Wilson uses to trace all knowledge ultimately back to the physical sciences, is equally invested in the ideal of 'innate' order.[101] A synthesising approach, as Gowan Dawson has pointed out, often 'appears to involve exchanging historical sensitivity and scholarly distance for fawning reverence and critical sleight of hand' – the danger of disciplinary imperialism, an area in which English Studies does not have a good track record, is very real (I return to questions of empire and categorisation in chapter 4).[102]

My focus on popular literature is a crucial element of my attempt to usefully study disciplinary demarcation without making claims beyond the field of English Studies.[103] Regardless of its value as a tool for understanding scientific culture, English will remain a useful way of understanding science *as active in culture* for as long as non-experts continue to interest themselves in, and have their imaginations fired by, scientific developments. Both the causes and consequences of scientific metaphors are to be found throughout popular culture, not just in the labs and journals of scientific institutions. Their constantly-shifting roles and meanings are also determined by the popularisers, authors, policymakers, and journalists who absorb, discuss, and recapitulate them (consciously or otherwise). This process can enormously affect how the scientific laity perceives a particular discovery or idea, and it is worth studying. English, a discipline centred around the explication of metaphor, is well-positioned to do this, so long as it remains mindful of the real-world utility of evidence-based scientific understanding and the real-world consequences of the systematisation

[101] Consilience is based upon 'a conviction, far deeper than a mere working proposition, that the world is orderly and can be explained by a small number of natural laws' (E. O. Wilson, *Consilience: The Unity of Knowledge* (London: Little, Brown & co, 1998), p. 3).
[102] Dawson, 'Literature and Science', p. 307. Dawson is here reacting to the rise of 'Literary Darwinism', a movement (chiefly within American scholarship) which seeks to subordinate literary studies to biology.
[103] Though I want to severely problematize the *de facto* assumption of divisions between disciplines, I make no claim that this thesis *constitutes* interdisciplinary work. The recent emergence of 'interdisciplinarity' as almost a discipline in its own right, and one which is becoming increasingly fashionable, is itself of interest.

of knowledge.[104] This is the wider project within which this thesis locates itself, and to which I return in the conclusion.

Approached from this angle, the *fin de siècle* magazine remains an attractive case study. Most of the publications I read in this thesis are associated with what Matthew Arnold derogatorily called 'New Journalism'. Arnold lamented both the popularity and the feather-brainedness of New Journalist publications, characteristics which I here treat as beneficial.[105] Another reason that he might not have liked them, though, was that they persisted in confusing the hierarchies he was active in establishing between both 'high' and 'low' and literature and science. New-journalist or not, general magazines formed a conflationary space in which all levels of scientific authority, amateur and professional, shared covers with fictional, journalistic, and editorial content. They were a major venue for science's interaction with the wider public, one whose importance in the study of science-in-culture is attested to by scholarly endeavours such as the SciPer project, which produced an online index of scientific references across sixteen publications,[106] as well as several volumes of interpretative essays.[107] James Mussell sums up the value of such studies when he points out that:

> Science in the periodical press is not an isolated representation of a distant practice but rather an important part of that practice that also shares the vicissitudes of readership, processes of production, and relationship to the marketplace common to all periodicals.[108]

The periodical emphasises two-way traffic not just via the physical connections between pieces published between the same covers (issues) but the less literal associations from volume to volume (titles) which constitute the magazine's

[104] In saying this, I am suggesting an additional (rather than an alternative) potential function for Literature and Science. Levine asserts that 'it is a central function of science and literature studies to read science with literary eyes' – an important project, but distinct from (though connected to) the principal objective of mine (George Levine, 'Science and Victorian Literature: A Personal Retrospective', *Journal of Victorian Culture*, 12 (2007), 86–96 (p. 95)).
[105] Matthew Arnold, 'Up to Easter', in *Essays, Letters and Reviews by Matthew Arnold*, ed. by Fraser Neiman (Cambridge, MA: Harvard University Press, 1960), pp. 338–54 (pp. 347–48).
[106] <http://www.sciper.org/>. SciPer is a rich resource, but not one on which I have relied heavily owing to its emphasis on the earlier nineteenth century (only one publication, *Review of Reviews*, is tracked into the 1890s).
[107] The main one being *Science in the Nineteenth-Century Periodical: Reading the Magazine of Nature*, ed. by Geoffrey Cantor and others (Cambridge: Cambridge University Press, 2004).
[108] James Mussell, *Science, Time and Space in the Late Nineteenth-Century Periodical Press: Movable Types* (Aldershot: Ashgate, 2007), p. 17.

identity through time (further discussed in chapter 2). It therefore constitutes a textual space which encourages Beer's notion of open fields, a space which brings 'into active play unexamined assumptions and so may allow interpreters, if not always the principles, to tap into unexpressed incentives'.[109] For Roger Luckhurst and Josephine McDonagh, too, the idea of the 'encounter' is an important one, 'less to do with conflict than […] with surprise: as for the surrealists, the *recontre* evoked chance, desire, the unforeseen yet meaningful connection'.[110]

I suggest that the periodical is a venue for especially vivid encounters of the kind which Beer, Luckhurst, and McDonagh find so interesting. Its diasporic content was capable not just of appealing to various readers, but of appealing to one reader, variously – the general magazine caters to the basic fact, often overlooked, that all humans live in more than one box, are interested in more than one thing. George Levine makes this point in his *Realism, Ethics and Secularism*:

> Think […] about the multiple ways in which we think of ourselves from moment to moment – say, white, Jewish, professional, lover, father, liberal, cynic, unbeliever, cheese-lover, adulterer, friend, teacher, liar, good guy, writer, critic, coward, bird-lover, duck-eater, failure, success… And yet with all the variations and all the contradictions, every morning we wake up being us. The 'self' affirms itself in the very continuity and ordinariness of our lives.[111]

As opposed to Wilson's consilience, a fantasy of *ultimate* order, the periodical constructs its continuous (and orderly) identity, as we ourselves do, out of a series of sometimes conflicted components.[112] Even and perhaps especially in its self-contradictions, it constitutes a single, identifiable, and consistent entity.[113]

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[109] Gillian Beer, *Open Fields: Science in Cultural Encounter* (Oxford: Clarendon Press, 1996), p. 2.
[110] Luckhurst and McDonagh, p. 6.
[111] George Levine, 'Introduction', in *Realism, Ethics and Secularism: Essays on Victorian Literature and Science* (Cambridge: Cambridge University Press, 2008), pp. 1–21 (p. 2).
[112] '…one of the exciting problems of our era consists of rediscovering the chaotic nature of knowledge' (Michel Serres, *Conversations on Science, Culture and Time*, trans. by Roxanne Lapidus (Ann Arbor, MI: University of Michigan Press, 1995), p. 127).
[113] Gowan Dawson makes a parallel argument about the similarities between the confusing, conflicted (but ultimately commensurate) vessel of the periodical and the body of a 'monster' (dinosaur) as recovered by early nineteenth-century palaeontologists. See Gowan Dawson, 'Literary Megatheriums and Loose Baggy Monsters: Paleontology and the Victorian Novel', *Victorian Studies*, 53 (2011), 203–30 (pp. 207–08).

The disadvantage is that as it is ephemeral, the periodical's hybridity is something we eventually lose. Rediscovering the periodical therefore means rediscovering those defining links between our assumed opposites. It means reminding ourselves that the two-culture divide is not a fundamental truth, visible at the base of human thinking once all else is stripped away, but an historical entity superimposed over time on top of a vast and complex network of interrelated ideas.

Consequentially, my aim is to highlight similarities between apparently unrelated pieces in the magazines. Before going into detail on the mechanics of this approach, though, it is worth answering one significant objection – one which any good scientist would also raise – my potential susceptibility to cherry-picking. As part of his caution against the pursuit of the Victorian 'one culture' ideal, Gowan Dawson has written:

> [T]he relationship between science and literature in the Victorian period could be considerably more complex and problematic than has generally been assumed in more sanguine scholarly accounts which, taking their lead from [Edward] Dowden, emphasize only the more positive aspects of [their] interchanges.[114]

Dawson points out that A. C. Swinburne presents a more 'potentially awkward and incongruous nature of literature and science in Victorian Britain' than figures like Tennyson or George Eliot, one which scholars interested in arguing for connections and similarities are incentivized to suppress (pp. 313-14). By the same token, the superabundance of source material in *fin de siècle* periodicals and the search facilities afforded by digitisation (see section three, below) make it relatively easy to find examples which support my conceptions and deemphasise inconvenient 'exceptions', which may in fact constitute a vast majority.

The first stage in answering this point is to admit that it would be impossible to entirely guard against this weakness in any piece of cultural criticism which attempted to engage with such a wide field. But the cherry-picking objection is also another reason to stress this project's firm situation within the discipline of English Studies: though using some historicist

[114] Dawson, 'Literature and Science', p. 313.

approaches and having, of course, a responsibility to historical accuracy, the primary goal of this work is *not* to paint a complete picture of Victorian periodical reading practice, or to provide a comprehensive analysis of sf's early days in *fin de siècle* magazines. Naturally, I hope it will contribute to the wider understanding of these areas. My main aim, however, is to offer a model for examining interrelations between literature and science which doesn't presuppose animosity and which does its best to problematize the abiding assumption that literature and science are essentially and fundamentally opposed. I am not attempting to deny differences, but I am attempting a practice which celebrates correspondences. In this, I follow the example of Michel Serres, whose own attempts to stress connections across the two-culture divide are the result of a profound belief in the need for peace:

> Cross-breeding – that's my cultural ideal. Black and white, science and humanities, monotheism and polytheism – with no reciprocal hatred, for a peacemaking that I wish for and practice. It's always peace, for a child of war.[115]

My 'cherry-picking', seen in these terms, is a political imperative rather than the chink in a claim to totality. Nevertheless, Dawson's warning is important, and it remains essential to be on guard against constructing harmonies which, however convincing they might be made by selective quotation, lack force when the original source texts are examined closely. I have been wary of this from the beginning of my research, and have attempted to conduct myself responsibly. It's also important that whilst I'm not extensively focussing on them, I do not deny the existence (or even the validity) of opinions other than my own – indeed, a necessary part of my argument about the periodical's ability to hold opposites in suspension is that there will inevitably be evidence which contradicts some of my claims. I approach the periodical, and its ability to render these conflicts non-violent, as a physical location which foregrounds (or at least permits the foregrounding of) positive interchanges across disciplinary and generic boundaries. Periodicals, I argue, are good places to find moments at which the entanglements of genres, discourses, ontologies, are particularly visible – correspondences between science and fiction. Luckhurst and McDonagh, I have

[115] Serres, *Conversations*, p. 28.

already mentioned, refer to these as 'encounters': 'It is only at such sites', Luckhurst claims, 'that the full sense of the networks of knowledge at work […] can begin to be recovered'.[116]

Put simply, the point is not to erase differences but to find a way of celebrating them. 'After all', writes Mikhail Bakhtin, 'the boundaries between fiction and nonfiction, between literature and nonliterature and so forth are not laid up in heaven'.[117] When we forget this – when we pay Gernsback, or anyone else, the homage of our assumptions – things can spiral out of control quite rapidly. Like Bakhtin, I want to stress the importance of heteroglossia, offering the many-voicedness of the magazine as an alternative to the warring, authoritarian monoliths we have inherited from Snow. It may be helpful, once more, to think about Darwin, as reported by Gillian Beer:

> The multiplicity of stories implicit in evolution was *in itself* an element in its power over the cultural imagination: what mattered was not only the specific stories it told, but the fact that it told many and diverse ones.[118]

The 'multiplicity of stories', as provided by popular magazines, is my way into trying to understand the relationship between literature and science.

III. Methodology

I have argued here that an interest in the location of truth is at the heart of the relationship between the emergence of sf, the emergence of the literature/science divide, and the emergence of the dyadic division between 'high' and 'low' literature. Linnean taxonomy has been widely seen since its emergence as a method of providing access to essential, pre-existing truth, and this perception has since stretched far beyond the realm of the natural sciences.

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[116] Roger Luckhurst, 'Passages in the Invention of the Psyche: Mind-reading in London, 1881-84', in *Transactions and Encounters: Science and Culture in the Nineteenth Century*, ed. by Roger Luckhurst and Josephine McDonagh (Manchester: Manchester University Press, 2002), pp. 117–50 (p. 143).
[117] Mikhail Bakhtin, 'Epic and Novel: Toward a Methodology for the Study of the Novel', in *The Dialogic Imagination*, ed. by Michael Holquist, trans. by Cary Emerson and Michael Holquist (Austin: University of Texas Press, 1981), pp. 3–40 (p. 33).
[118] Beer, *Darwin's Plots*, p. 106. Original emphasis.

In the *fin de siècle*, the periodical press was a staging-ground for many of these conversations, the form which allowed them to become so thoroughly and productively entangled. But I have also been arguing that disentangling them is not the way to solve the problems of conflict generated by a century of specialisation. Rather, this thesis presents the tangles themselves as both evidence of and an argument for a rich, cross-fertilizing culture sustained by a rejection of authoritarian discourse. Having worked through some of the politics of this argument, it remains to address the more mechanical aspects of methodology, which have started looking unmanageably complex. How are these tangled, illuminating moments to be found?

The first and most important step, already hinted at above, is to renounce any claim to comprehensiveness. According to a contemporary estimate, 2,263 separate periodical titles were in print in Britain in 1891, and this had risen to 2,767 by 1907.[119] Even with my decision to focus on London-based publications (493, ~22% of the 1891 figure, rising to 744, ~27%, in 1907), there remains far more material to read than could ever be tackled in one project (or career). Even at the time, W. T. Stead declared that '[n]o busy man can keep in touch with all or even with a section of our periodical literature'. Stead worried that '[m]agazines will in this way become more and more the exclusive study of the leisured literary class – the cultured Brahmins of our day', and his *Review of Reviews*, I have already noted, was part of an attempt to forestall this increasing specialisation.[120] It is true that the very fact of this unmanageable scale is in some senses part of my argument,[121] but in spite of the political opportunities provided by profusion,[122] the fact remains that it is both impossible to read everything and inadvisable to read entirely at random.

Focussing the enquiry on the Standard Illustrated Popular Magazines greatly reduces the amount of material (although there is still far too much).

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[119] *Sell's Dictionary of the World's Press and Advertisers' Reference Book*, ed. by Henry Sell (London: Sell's Advertising Agency, 1891), p. 12; *Sell's Dictionary of the World's Press and Advertisers' Reference Book*, ed. by Henry Sell (London: Sell's Advertising Agency, 1907), p. 8.
[120] Stead, 'Preface' (1891), p. iii.
[121] Of Bakhtin: 'He saw the world as irreducibly messy, unsystematizable, and contingent, and he regarded it as all the better for that' (Gary Saul Morson, 'The Process of Ideological Becoming', in *Bakhtinian Perspectives on Language, Literacy, and Learning* (Cambridge: Cambridge University Press, 2004), pp. 317–31 (p. 318)).
[122] Of *The Origin of Species*: 'Only gradually and retrospectively does the force of the argument emerge from the profusion of example. Such profusion, indeed, *is*, as in Dickens, the argument…' (Beer, *Darwin's Plots*, p. 42).

These publications contain, according to the accounts of both Sam Moskowitz and Mike Ashley, the preponderance of sf from the period – they also represent one of the era's defining innovations in popular culture, and follow a format and publishing ethos similar enough to make comparisons between them justifiable. This similarity is largely due to the success of the *Strand*, and that magazine's enormous influence on both the form and contents of popular magazines fixes this project's notional start date at 1891 (*Strand*'s first issue appeared in January of that year). This project runs up until 1905 because the arrival that year of the *Grand Magazine* (Feb 1905 – Apr 1940) and the *Novel Magazine* (Apr 1905 – Dec 1937) inaugurated the pulp in Britain, revolutionising the magazine industry just as much as the *Strand* had done. The pulps, soon joined most prominently by *The Story-Teller* (Apr 1907 – Nov 1937), had as their defining characteristic an *exclusive* focus on fiction – a step towards the genre-exclusivity of Gernsback and *Amazing Stories*, and away from the diversity which makes the earlier magazines so useful to my argument.[123] Of course, the *Strand* and its competitors remained in print – and they continued to publish sf – but the pulps were sufficiently game-changing to make their appearance a sensible cut-off moment for this study.

Having prescribed these dates and publications, it does not befit a project with the scepticism of boundary-making outlined above to be puritanical about them. Numerous other magazines contain relevant material – for example, *Cassell's Magazine* (Apr 1867 – Dec 1932), which predates the Strand by nearly 24 years but adjusted its format to match it in December 1896. Other publications, like the *New Review* (Jun 1889 – Dec 1897), resisted illustration but still printed sf (the *New Review* ran perhaps the most influential sf work of my period, H. G. Wells's *The Time Machine*, which I discuss in chapter 2). Equally, the lives of authors, titles, and scientific ideas beyond the fairly narrow dates 1891-1905 will occasionally take me outside them. Since even a prescriptive approach to publications and dates would leave me with far more material than I could comprehensively read, I see no reason to be embarrassed about this. I have, however, approached most of these other materials as outliers, returning

[123] 'The *Grand* ought to have the honour of being the first of the new generation of all-fiction pulp magazines that set the world alight in the late Edwardian age'; the *Novel*, though, even though it appeared two months later, was 'the first all-fiction British pulp' because the *Grand* only made the transition to all-fiction in 1908 (Ashley, *The Age of the Storytellers*, pp. 81 & 141).

constantly to the dates and publications which I have established as the project's centre. I hope that the reader will understand that this is due to limitations of time, resources, and the format of the PhD thesis rather than the result of a belief that my focus is on material which is necessarily 'better', more relevant, or more interesting.

Periodicals and their archives inherently raise a whole set of methodological questions, and work which seeks to engage with them needs to state its approaches more explicitly than, say, a single-author study.[124] My method has been to read through individual whole issues of magazines, building up an idea of how they are constituted, how they changed over time, and what they were interested in printing. I have not read every word of every magazine title I mention, even within the period 1891-1905, and it is very important to admit that up front (I have endeavoured, however, to read in full, where possible, every issue which contains a story I mention in this thesis). The aim of going through whole issues in this way was to allow major thematic preoccupations across both fiction and non-fiction to come to the surface.[125] Certain topics kept recurring, and I have selected four of those in which sf has a stake as the themes for the chapters which follow. Once these themes were identified, works such as Stead's *Annual Index* (a contemporary resource) or Everett F. Bleiler's *Science-fiction, the early years* (1990), both of which index entries by theme, come into their own as ways of finding more material. Whilst following these leads to find related material in other publications, I have been careful not to take from them blindly, and have continued to examine whole issues rather than individual

[124] Key works establishing approaches to this kind of material include *The Victorian Periodical Press: Samplings and Soundings*, ed. by Joanne Shattock and Michael Wolff (Leicester, Toronto and Buffalo: Leicester University Press & University of Toronto Press, 1982); Linda K. Hughes and Michael Lund, *The Victorian Serial*; and the more recent *Encounters in the Victorian Press: Editors, Authors, Readers*, ed. by Laurel Brake and Julie F. Codell (Basingstoke: Palgrave Macmillan, 2005). The scholarly community at the centre of this field is the Research Society for Victorian Periodicals, with its attendant *Victorian Periodicals Review* (Johns Hopkins University Press).

[125] 'Examining the *entire* contents of a periodical allows the historian to gain a more subtle, nuanced, and often very different picture of how Darwinism emerged, or indeed was submerged, in cultural discourse of the time' (Gowan Dawson, Richard Noakes and Jonathan R. Topham, 'Introduction', in *Science in the Nineteenth-Century Periodical: Reading the Magazine of Nature*, ed. by Geoffrey Cantor and others (Cambridge: Cambridge University Press, 2004), pp. 1–34 (p. 3). Original emphasis).

pieces wherever possible. Index work has also allowed me to follow authors and editors, both within and between publications.[126]

In the interests of understanding the magazine as a medium for correspondences between texts, I have always tried to make sure that index work comes *after* primary material, and the same rule holds for digital resources. Keyword searching has allowed me to make many connections which would have been near-impossible a few years ago, and archives of digitised material continue to improve in both scope and utility.[127] In particular, it is exciting that the *Review of Reviews* has been digitised, combining the benefits of late nineteenth-century indexing work with twenty-first century searching technology. Whilst acknowledging the digital archive's huge and positive effect on this project, though, it is important to have an eye on its limitations. James Mussell's *The Nineteenth-Century Press in the Digital Age* is a book-length consideration of these issues, a primary argument of which is that digital resources are 'editorial in nature', a fact which their medium allows us to easily overlook.[128] One of their hidden disadvantages is that only a fraction of titles are available: '[t]he ease with which we use resources and the way they blend in with the rest of the digital landscape mean that we are easily seduced by their claim to comprehensiveness and completeness' (p. 66). From the *fin de siècle*, the most notable absences from the digital archive at the time of writing (for my purposes) are *Pearson's Magazine*, *Tit-Bits*, and the *London Magazine*. Even titles which are available have not been completely scanned: it is very rarely that one finds a

[126] The reference work I have found most useful on magazines and their contributors is *Dictionary of Nineteenth-Century Journalism*, ed. by Laurel Brake and Marysa Demoor (Gent: Academia Press, 2009). For information on titles, I've profited from *British Literary Magazines: The Victorian and Edwardian Age, 1837-1913*, ed. by Alvin Sullivan (Westport, CT: Greenwood Press, 1984); Ashley, *The Age of the Storytellers*; and the standard reference work in this field, *The Waterloo Directory of Victorian Periodicals 1824-1900*, ed. by Michael Wolff, John S. North and Dorothy Deering (Waterloo: Wilfrid Laurier University Press, 1976). The best resource on sf is *The Encyclopedia of Science Fiction*, ed. by John Clute and David Langford (Gollancz, 2011) <http://www.sf-encyclopedia.com/>, to which I am a contributor. For issue contents and authorship, the standard reference is Slingerland, Jean Harris, ed., *The Wellesley Index to Victorian Periodicals 1824-1900* (Toronto: University of Toronto Press, 1989). Stead's *Annual Index* series aside, the most useful contemporary reference work is Poole's (especially, for me, the third supplement: *Poole's Index to Periodical Literature*, ed. by William I. Fletcher and Franklin O. Poole (London: Kegan Paul, Trench, Trübner and Company, 1898)).

[127] By far my most used digital resource is ProQuest's *British Periodicals Online*. Adam Matthew Digital's *Victorian Popular Culture* has also been useful, as have Gale Cengage's various archives. I have also accessed the bulk of journal articles I refer to digitally: major resources here are *JSTOR* and *LION*, as well as individual publisher subscriptions via Senate House Library, University of London.

[128] Mussell, *The Nineteenth-Century Press in the Digital Age*, p. 9.

digitised advertising supplement; editorial matter is often missed; the quality of scans, especially when taken from microfilm, often renders illustrations and smaller print illegible; and ephemeral components such as wrappers are seldom, if ever, seen (outside ProQuest's *John Johnson Collection*). From the perspective of this specific thesis, digitisation has an even more worrying consequence:

> Rather than the principal means through which readers accessed representations of the world and so made sense of their place within it, [newspapers and periodicals] become reduced to series of individual articles, standing alone against an undifferentiated cultural background.[129]

In the digital archive, articles are separated from their issues – even individual pages, Mussell points out, often becoming fragmented by the transition to a format in which searching outranks browsing.[130] Downloadable as discrete PDFs, individual pieces can now be read entirely divorced from the content with which they once shared covers; it is easier than ever to read an article from a newspaper or magazine without being brought into even passing contact with the material which appeared physically adjacent to it. Quite apart from the specific contentions about isolation and specialisation which this thesis is making, even those scholars not working on or with the material aspects of these texts do not know, when they consult them digitally, what it is that they are not seeing. None of this is to deny the utility of the digital archive, without which this project in its current form would have been virtually impossible. Whilst using the digital archive extensively, then, I have also consulted every magazine I reference physically wherever possible. I have been fortunate in this regard, having access to the archives, facilities and staff of Senate House Library, University of London, and the Upper Reading Room at the Bodleian Library, Oxford – scholars at a geographical remove from large reference collections are even more dependent upon the versions of texts mitigated to them by digital devices and, not insignificantly, the companies which regulate them.

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[129] Mussell, *The Nineteenth-Century Press in the Digital Age*, p. 31.

[130] 'Serial websites tend to be geared to searching rather than browsing and to the item (the article) rather than successive pages in an issue. It is often difficult even to find out how to browse successive issues of a single title' (Laurel Brake, 'Half Full and Half Empty', *Journal of Victorian Culture*, 17 (2012), 222–29 (p. 223)). This effect is equally pronounced in today's increasingly digitised scholarly journals, which generally offer individual articles for download rather than whole issues, and can be as difficult to browse as digitised primary material.

These companies continue to develop digital resources which invite new kinds of scholarly inquiry into print history. At the time of writing, the possibilities suggested by the development of ngram searching by the Google Books project (amongst others) for the statistical analysis of a corpus of texts ('culturomics') are tantalising, although they need approaching with some care.[131] It should come as no surprise to the reader that I find the construction of 'physical' and 'digital' approaches as exclusive opposites unhelpful, and that I believe that throughout these developments the strongest work will continue to make use of the benefits of both kinds of archive, whilst being ever-mindful of their respective weaknesses.[132] Print archives of magazines abound with limitations of their own: magazines tend to be held in special 'library editions' (typically collecting six months to a volume), and these have frequently been 'cleaned' of advertising, a process which sometimes removes editorial content as well.[133] Some library editions run issues together in a way which makes it very hard to determine what the original periodical looked or felt like; almost all of the titles I study also add material (typically titles pages and indices) which further distances their contents from those of the monthly publications of which they are a record. In three years of researching this topic, I have not seen an individual issue of a *fin de siècle* periodical, the actual object which would have been bought for 6d. (or thereabouts) by the citizens of 1890s London – the object, in short, of my study. Print archives are also, of course, susceptible to all of the usual problems of conservation – space, degradation, damage, theft, and so on – risks magnified by the fact that titles routinely take up whole shelves rather than single volumes. The British Library's copy of *Pearson's Magazine* has had the pages containing H. G. Wells's *The War of the Worlds* stolen from it; these pages cannot be seen digitally, not only because *Pearson's* is not yet online

[131] Jean-Baptiste Michel and others, 'Quantitative Analysis of Culture Using Millions of Digitized Books', *Science*, 331, 176–82. For a discussion of how culturomics might be applied to the study of nineteenth-century print culture, see Bob Nicholson, 'Counting Culture; or, How to Read Victorian Newspapers from a Distance', *Journal of Victorian Culture*, 17 (2012), 238–46.

[132] 'These archival forms, paper and film or electronic, ideally may be used in tandem' (Laurel Brake, *Print in Transition, 1850-1910: Studies in Media and Book History* (Basingstoke: Palgrave, 2001), p. 283).

[133] For example, *Pearson's* carried a one page item called 'The Editorial Mind' at the end of each of its early issues, typically used to outline the contents of next month's issue. It was part of the advertising supplement, and is therefore not in the British Library's run, although the editions held by the Bodleian preserve it. Recent discussion on the fallibilities of the library edition can be found in Laurel Brake, 'The Longevity of 'Ephemera': Library Editions of Nineteenth-century Periodicals and Newspapers', *Media History*, 18 (2012), 7–20.

anywhere, but also because access to all of Wells's contributions to the periodical press in scanned publications is withheld by the publishers until his estate comes out of copyright (fortunately, the Bodleian's physical copy remains pristine). This anecdote about the accessibility of an extremely popular and important novel in its first, periodical appearance captures some of the shortcomings of both print and digital resources.

My system of reading *fin de siècle* periodicals, then, is not without its disadvantages, and it bears re-stating that there *is* no realistic ideal: that comprehensiveness is impossible, that there is no logical path through the magazines which does not at some point contradict itself, and that this, I argue, is precisely the characteristic which makes them most interesting and valuable. In intellectualising my necessarily incomplete approach, then, I draw inspiration from W. T. Stead, who had the following advice on filing for aspiring newspaper editors:

> Do not aim at too great perfection. Be content with a practical rough-and-ready arrangement by which you can put your hands nine times out of ten approximately on what you want. If you aim at an ideal system, you will never be able to find anything at all unless you devote more time to your system than you can spare for your reading.[134]

This thesis applies a more rigorous approach to research than Stead, but is inspired and reassured by his 'approximately' here, and has not been afraid of serendipity in its explorations of its four main themes. The themes themselves were chosen because they represent preoccupations in the source material which seem to have allowed especially vibrant collisions between science and fiction in the periodical press. There is nothing particularly singular about any of them, and others could have been chosen, but each excited writers from both literature and science; each, pursued, ultimately leads to the questions of objective truth which stand, like sf, on the emerging border between the two.

Chapter 1, 'Intrinsic Intelligibility', is stimulated by the resurgence of popular interest in Mars in the 1890s and considers, as the Victorians did, the tantalising possibilities of interplanetary communication. This chapter is structured around one specific piece in the periodical press – Francis Galton's

[134] W. T. Stead, 'My System', *Cassell's Magazine*, August 1906, 292–97 (p. 297).

'Intelligible Signals Between Neighbouring Stars' (*Fortnightly Review*, November 1896). By both close-reading this article and pursuing some of its connections to popular culture, literature, and science, I argue that it proposes to bridge the communication gap between fields of knowledge – metaphorical 'worlds' – as well as between planets. The second chapter, 'Distance over Time', widens the focus slightly, examining a selection of fictional and non-fictional writings which offer visions of the future. Building on the first chapter's arguments that the periodical form materially alters and, more, empowers both popular science and the emergence of sf, this chapter studies its subjects' relationship to time, arguing that the magazine constitutes a temporal as well as physical space which is particularly conducive to vagueness. Vagueness, I suggest, is at the heart of the periodical's resistance to the authoritarian voice, a fact which makes it valuable as a format to both literature and science. But this value has its limits, and 'New Photography' – chapter 3 – explores one of these. Taking in a still wider range of material, this chapter focuses on the years immediately following the discovery of X-rays (in late 1895), analysing fictional and non-fictional accounts of this bleeding-edge technology, and in particular discussing the magazines' use of images, in order to understand the New Journalism's relationship to truth. Science, it finds, can be compromised as well as empowered by the magazines' insistence on heteroglossia – an apparently laudable insistence on democracy and the equality of voice led, in the New Journalism, to science being granted only an equal claim on the location of truth, rather than the superior ontological claim which it sought. The relationship between science, fiction, and periodicals, then, was a complex one, with both positive and negative characteristics: in my final chapter I explore one of the most fraught locations in which these characteristics were manifest – imperialism. 'Further Northward' is my most expansive chapter, examining a wealth of material on polar exploration to engage with the colonial attitudes which underscore geographical discovery, and which are also implicitly evoked in territorial discussions around genre or scholarly discipline. The imperialism visible in sf imaginings of the polar regions is, I argue, an innate part of the genre's heritage, so returning this material to its periodical context not only aids discussion of a darker side of sf's character, but also shows that the enriching exchanges between literature and science demonstrated throughout this thesis

could have many applications, not all of them laudable.[135] The polar writings, like all the primary material I discuss, evince highly complex relationships with truth, a fact which reflects not only the level of entanglement of fact and fiction in *fin de siècle* magazines but also the ways in which that complexity can be exploited by polarising, simplifying discourses. In my conclusion, I relate the way imperialism tries to simplify the world with the way that the two-culture model tries to simplify knowledge of it, positing the periodical as an example of the complexity through which both might be resisted and speculating on the role which English Studies can play in alleviating the problematic relationship between science and the present-day mass media.

The single dominant figure in *fin de siècle* sf is H. G. Wells, one of the three influential writers seized upon by Gernsback as a cornerstone for the genre. Partly because I wish to avoid biography, and partly because his work has been so meticulously examined by other scholars,[136] I have kept Wells at some distance. As it happens, however, each of the themes I tackle comes up in one of his major scientific romances, and this fact seems too convenient to ignore. Each chapter, then, also spends a short time with a specific Wells text: chapter 1 with *The War of the Worlds* (*Pearson's Magazine*, Apr – Dec 1897), chapter 2 with *The Time Machine* (*New Review*, Jan – May 1895), chapter 3 with *The Invisible Man* (*Pearson's Weekly*, Jun – Aug 1897), and chapter 4 with *The First Men in the Moon* (*Strand*, Dec 1900 – Aug 1901). My hope here is more than simply to put the reader at her ease by offering some familiar works amidst my obscurer findings: I also want to implicitly back up Steven McLean's point that Wells's work, so often considered in isolation from the periodical arenas in which it first

[135] '…no informed reader can doubt that allusions to colonial history and situations are ubiquitous features of early science fiction motifs and plots'; 'The apologetic function of the concept of race does not depend on precise categorization […] but simply on division itself. As long as race naturalizes the division between civilisation and savagery, its essential work is done' (John Rieder, *Colonialism and the Emergence of Science Fiction* (Middletown, CT: Wesleyan University Press, 2008), pp. 3 & 110).

[136] For some indication of this, see *Foundation*'s special issue on *The War of the Worlds* (28:77, Autumn 1999). The definitive biography of Wells is David C. Smith, *H. G. Wells: Desperately Mortal* (New Haven, CT: Yale University Press, 1986); a key critical examination of his writing is Patrick Parrinder, *H. G. Wells* (Edinburgh: Oliver and Boyd, 1970). Work which explicitly engages with the 'scientific romances' includes Bernard Bergonzi, *The Early H. G. Wells: A Study of the Scientific Romances* (Manchester: Manchester University Press, 1961) and, more recently, Steven McLean, *The Early Fiction of H. G. Wells: Fantasies of Science* (Basingstoke: Palgrave Macmillan, 2009).

appeared, was no less a part of it than anybody else's.[137] McLean thoroughly demonstrates that Wells's legacy loses nothing by his being re-situated within its periodical context – indeed, that it gains something.[138] This desire to reconnect fiction with its original periodicals is also the motivation behind my practice, with Wells and all other authors, of quoting wherever possible from primary magazine sources even where more recent, edited, scholarly versions of a text exist.

[137] 'It would, indeed, be difficult to understate the role of the periodical press in shaping the fortunes of the young Wells' (McLean, p. 1).

[138] Luckhurst reaffirms this point: 'The Wells of the 1890s did not write just scientific romances but also opportunistic Gothic tales (*The Island of Dr. Moreau*, for instance), social comedies about the cycling craze (*The Wheels of Chance*), whimsical fantasies about angelic visitation (*The Wonderful Visit*), and collections of light essays and journalism (*Certain Personal Matters*). It is important to emphasize the permeability between these different kinds of writing, the hybrid and 'impure' spaces from which the scientific romances appeared' (Luckhurst, *Science Fiction*, p. 31).

Chapter One: Intrinsic Intelligibility

I. The Mars Craze

In the autumn of 1892, the Earth and Mars were in favourable opposition. The two planets 'lined up' with the Sun, and a few days later passed within 60,000,000 kilometres of each other – almost as close as they ever get. On Earth, Mars would have appeared as one of the brightest objects in the night sky – easily visible to the naked eye as a blood-red star outshining everything but the Moon and Venus. It was the best view of Mars which the Victorians had seen since Schiaparelli had observed his *canali* during the favourable opposition of 1877, and it prompted much excitement in the periodical press as professionals and amateurs gazed skywards.[1] An article in the *Pall Mall Gazette*, written three years later, makes reference to one consequence of the craze:

> [T]here was a considerable amount of discussion as to the probability of [Mars] being 'inhabited'. Letters appeared in the daily papers, and nearly every one had something to say on the subject, and there was even some talk of trying to attract the attention of our Martian neighbours by heliographic signals. What language was to be used, and whether the signals were to be according to the Morse, or some other code, was apparently left for astronomers to decide, but scientists declined to undertake this

[1] For a summary of the Mars craze in the 1890s, see Robert Crossley, *Imagining Mars: A Literary History* (Middletown, CT: Wesleyan University Press, 2011), pp. 110–12.

> interesting work, and in the meantime Mars drifted away from us on his circumscribed journey through space.[2]

P. L. Addison, the author of this piece, captures wonderfully the correspondence between the planet's fading from the night sky and its fading from popular consciousness. But in claiming that scientists had 'declined' to investigate the idea of communicating with the red planet, he was slightly premature. As Addison was writing, an intelligence greater than his, and yet as mortal, was in fact working on the problem.

One of the 'letters in the daily papers' which Addison mentions had been written by Francis Galton (1822-1911; Fig. 1.1), a man of whom it may be enough to say that he invented both eugenics and a primitive kind of bicycle odometer. Half-cousin of Charles Darwin, Galton was responsible for breakthroughs in fingerprinting, statistics, meteorology, and much besides.[3] As close a figure as we might hope to find to the stereotype of the polymath Victorian inventor-scientist, he was also an enthusiastic communicator, writing prolifically for a general audience – lectures, books, and articles in periodicals. His zeal for this role was such that when he hadn't written an article, he could often be found making some point or clarification on the letters page of a magazine or newspaper. His contribution to the Mars craze was a letter published in the *Times* at the height of the 1892 opposition, in which he claimed that:

> With funds and good will, there seems no insuperable difficulty in […] sending signals that the inhabitants of Mars, if they have eyes, wits, and fairly good telescopes, would speculate on and wish to answer.[4]

Galton had invented a hand-held version of the heliostat – a signalling device which reflects sunlight in a targeted direction – whilst travelling in Africa in his youth (Fig. 1.2). He'd written up his experiences in *The Art of Travel* in 1858 and delivered a paper on heliostats to the British Association for the Advancement of Science in the same year. His experience gave him some authority with which to

[2] P. L. Addison, 'Is Mars Inhabited?', *Pall Mall Magazine*, 7 (November 1895), 442–48 (p. 442).
[3] For a detailed synopsis of Galton's career, see: Francis Galton, *Memories of My Life* (London: Methuen & Co., 1908); Karl Pearson, *The Life, Letters and Labours of Francis Galton*, 3 vols. (Cambridge: Cambridge University Press, 1914).
[4] Francis Galton, 'Sun Signals to Mars', *The Times* (London, 6 August 1892), p. 7.

address the possibility of using similar devices to communicate with Mars, and in his letter to the *Times* he comes to the conclusion that it should be possible to produce a signal visible at that distance – although there are difficulties:

> My own method is not practicable, at least without considerable addition and modifications, as it requires the object to be visible towards which the flash is directed, but Mars is not visible to the naked eye at day.[5]

This implied call for other suggestions was left unanswered, and Galton, like Addison, was compelled to watch Mars recede from the public eye. In a passage which strikingly mirrors Addison's, he was later to remark that:

> [T]he craze about Mars died away; the planet ceased to be particularly conspicuous, people grew tired of the topic, and the heated thoughts of many writers were cooled by copious douches of astronomical common sense.[6]

Galton's interest, however, had not been completely washed away. In the draft of a letter to the *Spectator* written less than a week after his letter to the *Times* (but never published), he had proposed using algebra as the basis of a language for the heliotrope signals: 'it is an interesting subject and possibly worth writing a few lines about'.[7] In fact, Galton found the subject so interesting that it was still in his mind nearly four years later, in the summer of 1896, when a 'somewhat dreamy vacation' afforded him the opportunity of enlarging upon his ideas.[8] The eventual result of this was the publication of an article called 'Intelligible Signals between Neighbouring Stars' in the *Fortnightly Review* for November of that year.

Although it is by no means an important work, even within the comparatively narrow scope of Galton's own output, 'Intelligible Signals' (as I shall hereafter refer to it) is a fascinating piece of writing, providing a rich microcosm of the issues surrounding the public communication of science. This entire chapter is devoted to analysing the article in context, the aim being to

[5] Galton, 'Sun Signals to Mars'.
[6] Francis Galton, 'Intelligible Signals Between Neighbouring Stars', *Fortnightly Review*, 60 (November 1896), 657–64 (p. 657).
[7] Francis Galton, 'Draft Letter to the *Spectator*', 1892, 177, The Galton Papers, UCL Library Services, Special Collections.
[8] Galton, 'Intelligible Signals', p. 657.

explore the way in which it confounds rigorous categorization, showing not only exchange between the supposed opposites 'science' and 'fiction', but also that each provides essential components without which the piece would be incomplete; the fictional elements and periodical format are not merely window-dressing for a scientific idea, but both reinforce the argument and subtly alter it. Unlike Galton's sun signals scheme, the periodical press is not a value-free communicator of information; science writing does not passively transmit its data to the reader. But I argue here that rather than compromising the piece, its formal similarities with the scheme it lays out (in which medium and message are synonymous) demonstrate that it is strengthened by its science-fictional associations: as a scientific speculation and as a magazine article, but above all as an appeal to the imagination.

The next section is a close reading of the article which shows that Galton's piece of popular science conforms, albeit perhaps accidentally, to several definitions of sf, but also argues that this fact is less important than the way in which it provides a way of regarding 'science' and 'fiction' as complementary rather than mutually opposed. The third section carries this analysis into the wider print culture of the 1890s, comparing Galton as a writer with two very different contemporaries in new journalist publications around the same time – H. G. Wells in *Pearson's Magazine* and W. T. Stead in *Borderland*. Each of these men, I shall argue, approached the issue of truth quite differently, but in the way all three write about Mars, fact and fiction can be seen working as allies rather than enemies. The final, fourth section of this chapter returns to the wider Mars 'craze' with which I began, arguing that Galton's implicit championing of the imagination as a tool for conveying science to the general public suggests a way of communicating not just between neighbouring stars, but between academic disciplines: the closeness of form and content in 'Intelligible Signals', idealised by the communication system it seeks to propose, not only teaches us about the relationship between science and fiction in *fin de siècle* magazines, but also offers an imaginative model for communication between spheres of knowledge.

II. Reading 'Intelligible Signals Between Neighbouring Stars' for Science, Fiction, and the Popular Press

Spiritually, 'Intelligible Signals' is much more the successor to Galton's unpublished *Spectator* letter than it is to the letter published in the *Times*, for it focuses on the issue of a language for use between the two planets, disregarding almost entirely the technical side of how the signals might be sent. Addison had observed in the *Pall Mall Gazette* that Morse code would be useless for something like this: it translates only back into the language from which it was encoded (and even then, only with a key). 'Signals have to be devised', remarks Galton, at the outset of his article,

> …that are *intrinsically* intelligible, so that the messages may be deciphered by any intelligent man, or other creature, who has made nearly as much advance in pure and applied science as ourselves.[9]

The puzzle which the article sets out to solve is that any message sent to Mars must be capable of translating itself. Galton claims that 'the reader will probably feel surprised at the unexpected simplicity' of his solution, but a present-day observer, even one with no training in linguistics or mathematics, cannot help but feel slightly dubious (p. 657). The scheme involves signalling some numerical rudiments via a series of flashes, slowly building up into quite sophisticated maths and conveying along the way a series of characters (sets of flashes) such as 'π', which could eventually form the basis of pictorial communication. There are a number of assumptive leaps, not least the supposition that any intelligence looking at a certain set of dots, dashes and lines will be able to infer an equals sign:

> Every line begins with one or more dots; then follows a dash; and then a word of two letters. There is one dot at the beginning of the first line, two at that of the next, and so on regularly up to the seventh. The symbols at the end of successive lines are those of the successive combinations of *dot*, *dash*, and *line*, taken in order up to the seventh; the eighth which is — –, and the ninth which is

[9] Galton, 'Intelligible Signals', p. 657. Original emphasis.

> — —, are not used. The arrangement suggests that the dash means 'is equal to', and that the symbols are those of numerals…[10]

This is to say nothing of the even more basic inferences, which the Martians would already have had to make in order to get this far, about the existence of letters, words and line breaks – much is being assumed of this conjectural alien civilisation. Criticising this communication system as a scientific idea, though, is naturally not my objective here: I'm more interested in what Galton's article tells us about disciplinary and generic relationships in the periodical press than in what it tells us about how we might communicate with Mars. In order to definitively argue that the piece can provide insight into the relationships between literature, science, and popular culture, however, it is first necessary to establish that Galton was participating in all three. The work of this section is therefore to argue that 'Intelligible Signals' constitutes a piece of imaginative writing; that it not only exhibits the tropes of popular fiction but that they are productively intertwined with (and arise in consequence of) its scientific arguments. A necessary first step in making this argument is to establish that Galton took his idea seriously and considered it a genuine scientific proposition, regardless of how feasible it may look to us today.[11]

The following passage comes from later in the article, a point at which the signalling system has been developed to the extent that messages are being used to draw pictures, as if on graph paper:

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[10] Galton, 'Intelligible Signals', p. 660.

[11] Galton needn't have been so concerned about finding Mars by daylight. According to Dr Kate Lancaster and her colleagues at the Rutherford Appleton Laboratory, this would have been simple with Victorian equipment (calculating its daytime position in the sky based on its trajectory in the night). However, the physics behind the scheme of signalling Mars with mirrors is flawed in other respects. The principal objection seems to be that the ruse would have required larger and better mirrors than the Victorians were capable of producing – Galton's references to numerous Martian mirror-operators requiring drills seem a partial acknowledgment of this. Another problem is that when the Earth and Mars are closest to each other, the Earth is directly between Mars and the Sun; it would be near the Sun in the Martian sky, and discerning the signals would be much harder. There are several other technical objections to the scheme, although Lancaster and her colleagues also pointed out that many of Galton's calculations and suppositions are broadly correct. These details are provided in a footnote because, again, the actual practicability of Galton's idea is not the primary interest of this chapter.
Dr Lancaster suggested that lasers, rather than mirrors, might overcome the majority of the technical problems, and that this might be the best way of flashing messages to Mars had we the desire to do so today. Proposed by Albert Einstein before Galton's death (but after the publication of 'Intelligible Signals'), the first working laser was demonstrated in 1960.

> [B]oth the length of the stitch and its inclination may be specified more delicately by the help of decimals. Thus let *j* be the symbol for a stitch in any given direction, then 0.5 x *j* means a half-length stitch in the direction *j*. A series of 4 triangles were signalled to explain this, in which the angles corresponded exactly with certain of the rhumbs, while the sides had to be expressed with decimals.[12]

The tone Galton uses here is dry and measured, the voice of the lecturer. The 'let *x* equal *y*' model of sentence construction remains an archetype of scientific language, and the word 'expressed' in this context would appear at home a present-day maths textbook. This passage is taken from a far longer section, pretty much any of which could have been excerpted to make this point. Galton's language and bearing throughout the piece indicate a certain seriousness of purpose, and he is often at pains to underline the fact that he has thought thoroughly about his subject and is speaking with good authority.
Complementing his language is his choice of the *Fortnightly Review* as the venue for the article's publication. The *Fortnightly* had been in print since 1865 with a mandate to promote independent, intelligent thought. By 1896, its relatively advanced years carried almost as much weight as the names of its contributors, and it was the first magazine to adopt signature – George Eliot, Walter Bagehot and George Meredith had all contributed to the first volume.[13] Whilst not primarily interested in science, the *Fortnightly* had listed it in its opening manifesto as one of the six key areas in which it intended to publish (the other five were Literature, Art, Philosophy, Finance and Politics) and it had strongly supported the evolutionists, publishing articles by T. H. Huxley and Herbert Spencer among others. It set type in one column across the page and carried no illustrations, printing diagrams and tables only when the subject matter strictly demanded it. A synopsis of nineteenth-century literature published in the same year as Galton's article mentions the *Fortnightly* as a publication which, despite printing some fiction, 'busied [itself] with more or less serious subjects'.[14] The magazine typically featured a large amount of social and political commentary, with articles on 'The Cyprus Convention', 'Lord Rosebery's Resignation' and

[12] Galton, 'Intelligible Signals', p. 663.
[13] Mark W. Turner, *Trollope and the Magazines* (Basingstoke: Macmillan, 2000), p. 121.
[14] George Saintsbury, *A History of Nineteenth Century Literature (1780-1895)* (London: Macmillan, 1896), p. 382.

'The Struggle Before Us' all appearing in the same issue as 'Intelligible Signals'. Galton shared space with literary criticism too, in the form of 'Emile Verhaeren: The Belgian Poet' and 'William Morris: A Eulogy'. In short, Galton's choice of the *Fortnightly* suggests that he wished for 'cultivated and thoughtful readers',[15] and this fact, combined with the time he spends on the mathematical nuances of the idea, the tone in which he expresses it, and his own reputation as a scientist, strongly indicates that he was far from frivolous in putting it forward.

The fact that Galton was making a serious suggestion, however, has not prevented the final document from incorporating elements of imaginative writing which align it with many early works of sf. Galton first strays into this territory on the article's second page, in a crucial, revealing sentence:

> The simplest way of explaining my method is to suppose that Mars began to signal, to the wonderment of our astronomers, who sent descriptive letters to the newspapers from day to day, out of which the following imaginary extracts are taken:-[16]

With these words, Galton introduces the article's main structural conceit, which is to describe his proposition through a series of eleven numbered 'newspaper extracts'. These extracts constitute almost the entirety of the piece: written in the voices of several unnamed personae, at least one of them a scientist, they are distinguished from the brief introduction and conclusion (and the text of the other articles in that issue of the *Fortnightly*) only by the fact that they appear in slightly smaller print. Apart from a few headlines in small caps, there is no attempt to re-create the visual style of a newspaper (Fig. 1.3), but the excerpts, supposedly gleaned from successive days' reporting on Martian communication, take the reader through the decipherment of Galton's code as if they were witness to the gradual unfolding of a public event rather than the solving of a scientific problem.

What is immediately and inescapably obvious about this method of exposition is that it is very far indeed from the 'simplest way' of explaining anything. There are certainly advantages to the format in terms of gently introducing the audience to a fairly complex idea, but it seems a cumbersome

[15] *Fortnightly Review*, 1 (1865), inside cover.
[16] Galton, 'Intelligible Signals', p. 658.

imposition on the mathematical side of the discussion which is purportedly Galton's primary focus. It forces numerous descriptive tangents as well as breaks which seem increasingly unnecessary and artificial as the piece moves on. But though it appears to be an artificial medium for scientific discourse, the 'newspaper extracts' format – specifically, the sequencing of the solution around a developing event – are a very good source of *narrative*, which the core idea of communicating with Mars using algebra notably lacks. The newspaper, despite its supposedly dry and objective tone, implicitly generates sensation as well as narrative: Matthew Rubery has argued that it is *because* of the neutral tone of items like the shipping intelligence that nineteenth-century novelists were able to use newspapers as such ample sources of drama and suspense.[17] It is difficult to imagine a reason other than suspense, for instance, for Galton's inclusion of a newspaper extract which says, in full, 'COMPLETE DECIPHERMENT OF THE FIRST PART OF THE MESSAGE FROM MARS. Full particulars tomorrow'.[18] Entirely redundant from a simply explanatory perspective, this short passage can only have been included as a dramatic device, Galton's 'use of the methods of the press, in the words of one newspaper editor, to strike the reader right between the eyes'.[19] Galton's deployment of this technique places him – if only in one small respect – in the footsteps of the most established fiction writers of the Victorian age.

The presence of the newspaper extracts implies an even greater depth to Galton's imaginative work, however. Since the 'extracts' were never published individually, the suspense generated by this headline comes not directly from the gaps between them, but through empathy with an imagined reader in Galton's world, who must wait until the next day for 'full particulars'. The real-world reader of the article need only flit their eye to the next line in order to find out what happens next; to experience the story as a developing event (which is what the narrative demands) they must at some level imagine the sequence of extracts as being separated chronologically as well as physically. The extracts evoke a periodical temporality, imposing upon an article concentrated in one time and place the imaginative and narrative dimensions of an unfolding national event.

[17] Matthew Rubery, *The Novelty of Newspapers* (Oxford: Oxford University Press, 2009), pp. 23–45.
[18] Galton, 'Intelligible Signals', p. 659.
[19] Rubery, p. 14.

The reader comes to the extracts as an historical artefact, the suspense being generated retrospectively.[20] The two line diversion, then, doesn't just give reign to narrative: it breathes life into an entire fantasy universe. This universe, the one in which the Martians are signalling, is physically demarcated from ours on the page by the smaller font size in which the extracts appear. It functions, complete with novum, in exactly the same way as an sf universe created purely for storytelling purposes.

Not only is the newspaper format sensational in and of itself; the practice of quoting from it for the purposes of narrative exposition also aligns 'Intelligible Signals' with the stalwarts of popular fiction. The device echoes Edgar Allan Poe, who uses it to lay out the facts in his famous tale 'The Murders in the Rue Morgue' (*Graham's Magazine*, April 1841). In this story, a review of nearly all the evidence put before the detective M. Dupin is first encountered by the reader in pages of quotation from 'an evening edition of the *Gazette des Tribunaux*'.[21] The narrator's voice returns only to link quotations from the newspaper together ('The next day's paper had these additional particulars'), performing a similarly retrospective suspense function to Galton's 'full particulars tomorrow'.[22] Newspapers, says Rubery, were 'just one of the ways in which novelists played upon audience expectations by introducing competing layers of verisimilitude into the fictional narrative':[23]

Galton's deployment of this same strategy seems on first glance indicative of an important break with the scientific style in which he couches much of his essay. But in fact, Poe is also dependant on the scientific style, using it not just during the newspaper description already quoted, which is detailed and dry despite its disturbing content, but also for the lengthy essay on inductive reasoning which opens the story and which is anything but sensational in tone. Since 'The Murders in the Rue Morgue' is often regarded as a highly influential early work of detective fiction, it is perhaps no surprise that the genre has connection points with popular science, a point which H. G. Wells was keen not only to draw attention to, but to applaud:

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[20] I expand on this notion of periodical temporality in the next chapter.
[21] Edgar Allan Poe, 'The Murders in the Rue Morgue', in *Edgar Allan Poe: The Best of his Macabre tales complete and unabridged* (London: Prion, 2009), pp. 97–136 (p. 103).
[22] Poe, p. 107.
[23] Rubery, p. 12.

> The fundamental principles of construction that underlie such stories as Poe's 'Murders in the Rue Morgue,' or Conan Doyle's 'Sherlock Holmes' series, are precisely those that should guide a scientific writer. These stories show that the public delights in the ingenious unravelling of evidence […]. First the problem, then the gradual piecing together of the solution. They cannot get enough of such matter.[24]

Already, science and sensation begin to look far from mutually exclusive as forms of writing. Wells's comment suggests that the scientific method could itself be considered a form of entertainment, and the more-than-glancing similarities between the eccentric polymaths Sherlock Holmes and Francis Galton hint at a readerly preference for certain kinds of character and narrative, regardless of whether or not they are imaginary.

Galton brushes against fiction again when, not wishing either to commit himself to a definite physical location or to fall back on a potentially jarring fabrication, he substitutes 'the X. observatory' for the name of the institution where the signals are being recorded. On the one hand, this is a scientific gesture: it makes explicit the hypothetical nature of the account, and doesn't draw a particular institution (such as the Lick Observatory, which Galton names in his initial and narrative-free letter to the *Times*) into collusion with Galton's theories. At the same time, though, the 'X' also encourages the reader to 'fill in the blank', just as the narrator does in Poe's 'The Purloined Letter' to evoke a sense of mystery around the identities of 'Minister D—' and 'Monsieur G—'.[25] This speculation-inviting absence can be observed beyond the simple omission of proper nouns in Galton's writing: precisely because he wishes to stay on-topic, he leaves undiscussed or undescribed nearly all of the most tantalising questions arising from communication with extraterrestrials. His very reluctance to talk about the Martian society – doubtless a product of wishing to discuss only those issues immediately pertinent to his communication system – imbues it with a mystique, one which becomes so compelling that even Galton himself has trouble resisting it. For instance, when the algebraic signals reported in extract seven reveal that the Martians seem to have a base-eight (octal) rather than a

[24] H. G. Wells, 'Popularising Science', *Nature*, 50 (26 July 1894), 300–01 (p. 301).
[25] Poe is just one example of course – another would be 'Mr. B' in Samuel Richardson's *Pamela*.

base-ten (decimal) counting system, the director of the X. observatory offers a perfectly sensible-sounding mathematical solution (the numbers 1 to 7 and 0 'exactly use up the nine words of two letters each' available when using only the three different types of flash which Galton has limited himself to) before adding, arrestingly:

> A clever little girl who has helped us much by her quick guesses, intreats me to add her own peculiar view, which is that the Mars-folk are nothing more than highly developed ants, who count up to 8 by their 6 limbs and 2 antennæ, as our forefathers counted up to 10 on their fingers. But enough of this.[26]

That last sentence is revealing. It represents not just the director of the observatory resisting the urge to slip into idle theorising, but also Galton resisting the urge to slip into idle fantasising. These eddies, little moments of character which pull the narrative in the direction of the fantastic against Galton's better judgment, crop up repeatedly throughout the article. Galton, it seems, has great difficulty living up to his declaration, in the first newspaper extract, that 'it is well not to indulge too freely in wild speculation' (p. 658). It is important that the speculation in which Galton goes on to indulge arises directly because of his urge to be restrained and scientific, rather than in isolation from it: there is, in other words, a causal link between these two supposedly contradictory tendencies.

The clever little girl's 'ants' theory is not the only example of Galton being carried off by the force of his narrative. I have quoted more extensively here in order to show the rapidity with which the article's tone changes:

> Also the average times occupied in signalling these words, including the 3 seconds' pause at the end of each, are 6, 10, 15, 20 and 24 seconds respectively. Whatever the Mars-folk may have to say must be briefly expressed, and it seems incredible under these conditions that anything could be communicated by them to us which shall be intelligible and of value. Some persons are disposed to ascribe this immense undertaking to the caprice of a mad millionaire in Mars, or rather to a mad billionaire. There have been instances in the past history of our earth of many gigantic follies, without counting the traditional Tower of Babel.[27]

[26] Galton, 'Intelligible Signals', p. 661.
[27] Galton, 'Intelligible Signals', p. 658.

Without even a paragraph break, a discussion about the brevity of the interplanetary signals lapses into a set of assumptions about the Martians. They apparently have an individualist society structured around a capitalist economy, and they are also capable of mental eccentricities and madness. Madness carrying the required concept of sanity along with it, this sentence also gives us a sense of a Martian status quo – one which looks alarmingly similar to ours. Before any of this, we have numerous other assumptions to implicitly accept: that the Martians have eyes, that those eyes are sensitive to the same wavelengths of light as ours, that the Martians share our curiosity for the heavens, that they would regard flashes from a nearby planet as strange or interesting, that they would strive to communicate with their neighbours even if they thought it possible, and so on. Galton's reluctance to think outside the framework of what he calls 'the civilised nations of the earth at the present time' is not merely a narrative flaw, for, as mentioned above, his assumptions pervade the actual communication system, not just the manner in which 'Intelligible Signals' advances it (p. 664). That the substance and style of this piece both, for all their apparent disconnectedness, exhibit this flaw is a compelling argument against reading the narrative eddies as purely decorative.

The mystery surrounding the Martians is heightened by Galton's decision to cast them, rather than the humans, as the senders of the messages. If the objective were the mathematical explication of a hypothesis, making Earth the source of the signals would eliminate the temptation to speculate about the Martian civilisation – and indeed, earlier drafts of Galton's idea, which lacked the narrative elements, also imagined Earth as the source of the messages.[28] Whilst it might be argued that the change explains the scheme more effectively

[28] A draft of a lecture which contains an early form of Galton's scheme (January 1893) entirely lacks the narrative elements of the idea and doesn't mention interplanetary signalling until page sixteen (of twenty-four). When it does finally discuss it, the Earth is the source of the hypothetical messages – indeed, Mars is not named (although a reference to 'speculation last summer of the possibility of inter planetary communication' makes it unlikely that Galton is referring to anywhere else). There is even some suggestion that in the very early stages of composition, Galton was thinking too abstractly even to allow Earth to be involved: the phrase 'so let us suppose then two detached planets having absolutely no other knowledge of one another' has been amended in the draft to say 'the inhabitants of another, some imaginary celestial body, having absolutely no other knowledge of us or we of them…'. This draft, which I discuss further in section four, below, shows that the little girl, giant ants, newspaper format, and Earth-as-receiver situation were all added later, when the idea was rewritten for publication in the periodical press. I suggest that this is not a coincidence (Francis Galton, 'Signals', 1893, pp. 16 & 17, 154D, The Galton Papers, UCL Library Services, Special Collections).

by showing the signals being decoded, walking the reader through the inductive processes which constitute the scientific idea, the decision to cast Mars as the sender also has the important effect of eliding a number of the scheme's significant flaws, principally the fact that Galton did not know (as he admits in his 1892 *Times* letter) how such signals might actually be sent. All need to discuss the mechanical side of how to transmit them is wiped away by this narrative decision. It allows Galton to focus on the scientific aspect he finds really interesting – the code – without being encumbered by inconvenient technical pitfalls. Put differently, asking an audience to believe in an untenable signalling system is easier if you already have them imagining an entire civilisation on a different planet. Galton's science, as well as his story, is therefore to some extent dependant on the existence of a fantasy universe. In his world, unlike the real one, his brilliant idea can work, and does.

A more basic fact makes the narrative eddies seem less like afterthoughts on Galton's part: they recur, their apparently throwaway characters and speculations popping up again after a few pages:

> The phenomenon is most extraordinary. If it be effected through the money of a mad millionaire, he must have had the sense to subsidise an uncommonly intelligent director of works.[29]

The clever little girl also makes a reappearance:

> There was some delay in puzzling out the above interpretation ; it was first discovered by the young lady mentioned above, who is more successful than most of her companions in guessing charades and at such like games.[30]

Though the nameless little girl's time on the page is brief – all of it has now been quoted here – it is more than enough to create through implication an entire new subplot to Galton's story. The trope of the young, perspicacious heroine, prominent in popular literature since at least the publication of *Alice's Adventures in Wonderland* (1865), provides ample source material for the reader to draw on when filling in this blank, essentially no different from the list of

[29] Galton, 'Intelligible Signals', p. 659.
[30] Galton, 'Intelligible Signals', pp. 662–63.

observatories, real and fictitious, which could conceivably be stood for by Galton's 'X'. The little girl's subplot engenders functions at yet another remove from Galton's scientific idea, because rather than relating directly to Mars (like the giant ant theory) it encourages the reader to consider characters and background narrative on Earth. Not even speculatively related to the communication problem, its only possible function is plot embellishment.

There are other moments in this article where Galton turns away from efficient scientific communication to indulge fictional or assumptive idiosyncrasies, but hopefully sufficient evidence has been amassed here for me to make two main points. The first is that these idiosyncrasies arise inevitably from Galton's choice of narrative architecture. A scientific treatise, of the kind sometimes published by the *Fortnightly*, might not have required the giant ants or the little girl. But the New Journalism had made the newspaper form, even in the assessment of one of its enemies, Matthew Arnold, inherently 'full of […] novelty, variety, [and] sensation'.[31] Galton could not assume that form, even briefly, without bringing traces of those characteristics along with it. His article, in using the voice of journalism, could not entirely avoid *becoming* it, becoming a piece 'whose appeal derived from a subjective interest in the evolving human drama'.[32] The fact that the 'Intelligible Signals' scheme failed to appear before the public several times prior to its eventual publication in the *Fortnightly* can be at least partly attributed to the fact that its various draft versions lacked the fictional apparatus, and were in some sense incomplete or unsatisfactory without it, either to Galton or to his editors.[33]

The most obvious way of objecting to this reading would be to claim that the disruptive eddies in Galton's narrative represent an attempt on his part to sugar the pill, to ameliorate the complexity of his ideas and make them palatable to a general audience. It is quite possible that they were intended for this purpose, but that cannot be *all* they are for. Gillian Beer has demonstrated with her reading of the *Origin of the Species* 'the degree to which narrative and argument share methods'.[34] 'Intelligible Signals' and the *Origin* are very different pieces of

[31] Arnold, 'Up to Easter', p. 348.
[32] Joel H. Wiener, 'Introduction', in *Papers for the Millions: The New Journalism in Britain, 1850s to 1914*, ed. by Joel H. Wiener (New York, NY: Greenwood Press, 1988), p. xi–xix (p. xii).
[33] These drafts are discussed further in section four, below.
[34] Beer, *Darwin's Plots*, p. xxv.

work, but they were both written by scientists who thought carefully enough about how to lay their ideas before the public that the methods they eventually chose should not be dismissed as superfluous. The eddies in 'Intelligible Signals', to use Beer's words, 'cannot be skimmed off without a loss' (p. xxv). This brings me to my second main point, which is that as well as being the consequence of Galton's narrative choices, the idiosyncrasies are so closely related to the serious scientific proposal that is not necessarily useful to think of them, as I have so far for rhetorical purposes, as opposed and separable elements of a conflicted text. 'Intelligible Signals' is not conflicted at all – it has, in fact, a remarkable singularity of purpose, one which is masked only when the text is approached with the preconception that science and fiction are fundamentally incommensurate. The 'blanks' which the reader is implicitly invited to fill in are not only part-rooted in a desire to be more dispassionately scientific, but also, combined with the suspense mechanisms inherent in the newspaper extracts, constitute an encouragement to speculate, to approach the problem actively rather than passively.[35] In short, Galton's appeal is to the scientific imagination, and it is with this in mind – 'science' and 'fiction' drawn on together rather than as opposites – that his article is best read.

When Galton sent the article to the *Fortnightly*, its editor, W. L. Courtney, wrote back to ask if its introduction could be removed: 'Would you mind if I omitted the opening sentences & made the paper read like a genuine account, only disclosing at the end that it was imaginary[?]'.[36] Galton's refusal to accede to this request demonstrates even better than his imaginative restraint against the odds, even better than his predominately dry tone, how crucial it was to him that this piece not be misconstrued as fantasy or a hoax.[37] Had 'science fiction' been a term in 1896, he would presumably have balked at its being applied to 'Intelligible Signals'. Even today, the piece could not be so labelled without some contention, and although I have demonstrated here that the case could be made, what is important here is not ultimately whether or not this piece

[35] For more on this, see my discussion of Caroline Levine in section four of the next chapter.
[36] W. L. Courtney to Francis Galton, 1896, 241/9, The Galton Papers, UCL Library Services, Special Collections.
[37] I have not seen Galton's reply, but Courtney's response to it was to write again, saying: 'By all means let your article stand as it is at present. Mine was only a suggestion for you to consider' (W. L. Courtney to Francis Galton, 1896, 241/9, The Galton Papers, UCL Library Services, Special Collections).

of writing by a famous scientist 'is sf'. Sf or not, 'Intelligible Signals' shows that a scientific idea from a serious scientist is not in conflict with its fantastical framework. Far from it, it seems to its author that an alliance of the two is 'the simplest way' to explain his thinking.

In an essay on 'Late Victorian Science and Science Fiction', Paul Fayter draws attention to the complexity of the relationship between the two supposed opposites:

> Professional scientists not only helped shape science fiction, in many cases their work was shaped by it. In a time of rapid industrialization, professionalization, and specialization, this late Victorian literature played a role in maintaining a common popular scientific culture.[38]

In Galton's article we see an illustration of Fayter's point: Galton both draws on and, in somewhat smaller measure, contributes to the development of both science and popular fiction. 'Intelligible Signals' evinces cooperation between the form of journalism and the content of a scientific thesis, and the two demonstrate a remarkable synergy thanks to their shared relationship with narrative, not in spite of it. In this respect at least, the article does bear an intriguing resemblance to the signal system it proposes. Galton wrote in a draft of the idea that the laws of arithmetic were the best way of achieving intrinsic intelligibility because they 'have the property of expressing much of their meaning by their *form*'.[39] The whole point of his signalling system, in other words, is that its form and content are synonymous. As with the code, so, more subtly, with the article advancing it.

III. 'Intelligible Signals' *in situ*: H. G. Wells and W. T. Stead

'Intelligible Signals' appeared in November 1896. In the previous month's issue, the *Fortnightly Review* had published an essay on evolution by H. G. Wells, forty-four years younger than Galton and just at the beginning of his literary career. Wells had already made a name for himself with a number of

[38] Fayter, p. 257.
[39] Galton, 'Signals', pp. 18–19. Original Emphasis.

short stories and, of course, the serialised publication of *The Time Machine* (*New Review*, Jan – May 1895), now regarded by many as a watershed moment in the emergence of science fiction.[40] Despite his prominence as an author, however, Wells was a former pupil of T. H. Huxley and his engagement with 'serious' science in both fiction and non-fiction was considerable. In this section, I begin by comparing Wells and Galton in order to problematize the easy juxtaposition of them as 'novelist' and 'scientist'. I then introduce the figure of W. T. Stead, a journalist reporting on supposed psychic communications from Mars, arguing that although each of the three writers approaches truth in a different way, each has recourse to a kind of alliance between fact and fantasy in so doing.

Wells's article in the *Fortnightly* is called 'Human Evolution, an Artificial Process', and tasks itself with explaining why, if evolution is a reliable theory, humans have not changed biologically since the Palaeolithic period. It includes sentences like this one:

> Holding the generally-accepted views of variation, we must suppose as many human beings are born below the average in any particular as above it, and that, therefore, until our civilisation changes fundamentally, the intrinsic average man will remain the same.[41]

Focussing on the tone rather than the content of this sentence, we can see a marked similarity to the introduction which Galton refused to let W. L. Courtney cut from 'Intelligible Signals'. But the similarities between the Wells and Galton are not just stylistic: both men are arguing a distinct scientific theory before the public; both attempt to convince on the basis of logical reasoning rather than experimental evidence. Their pieces are fairly light on statistics – Galton's is, of course, entirely speculative – emphasising (and, perhaps, attempting to encourage in others) the thought processes that drive scientific advancement rather than showcasing new quantitative data. Nowhere in 'Human Evolution' does Wells seem hindered by the fact that his principal qualification in discussing the subject is his own interest; similarly, Galton was a well-known scientist, but astronomy and linguistics were hardly areas in which he could claim a special

[40] See, for example, Everett F. Bleiler, *Science-fiction, the Early Years* (Kent, OH: Kent State University Press, 1990), pp. 796–97.
[41] H. G. Wells, 'Human Evolution, An Artificial Process', *Fortnightly Review*, 60 (October 1896), 590–95 (p. 592).

expertise. The underlying implication is that science can be expected to interest anybody of intelligence, and that this applies to those who write it as much as those who read it. As Wells says elsewhere:

> It should also go far to reconcile even the youngest and most promising of specialists to the serious consideration of popular science, to reflect that the acknowledged leaders of the great generation that is now passing away, Darwin notably, addressed themselves in many cases to the general reader, rather than to their colleagues.[42]

The two men have subject areas in common as well. The issues which Wells is discussing in 'Human Evolution' interested Galton deeply, and he did some of his most famous work on them. Though the two differed in their conclusions, Wells closing with a view which 'reconciles a scientific faith in evolution with optimism', their shared subject matter, along with their shared language and choice of publication in the *Fortnightly*, testifies to a proximity which might at first be surprising given that one was the author of famous scientific romances and the other a fellow of the Royal Society.[43] Where there are differences between the two, they are not always the ones which might be expected. For instance, Wells would not have enjoyed Galton's light-hearted asides about Martian ants – at least, not if his article on 'Popularising Science', published two years earlier in the science journal *Nature*, is to be believed. An explicit discussion of the value of communicating science to the public and the best ways of approaching that task, this essay begins by asserting that the contempt in which popular science is held by many scientists may be 'not altogether undeserved', and continues:

> …one may even go so far as to object altogether to the facetious adornment of popular scientific statements. Writing as one of the reading public, I may testify that to the common man who opens a book or attends a lecture, this clowning is either very irritating or very depressing.[44]

[42] Wells, 'Popularising Science', p. 300.
[43] Wells, 'Human Evolution', p. 595.
[44] Wells, 'Popularising Science' p. 300.

Wells here identifies himself as a consumer rather than a producer of popular science. His authority is that of the educated layman, and it is on the behalf of the general readership that he is aggrieved by what he interprets as condescending gimmickry. His message is straightforward:

> …scientific exponents who wish to be taken seriously should not only be precise and explicit, but also absolutely serious in their style.[45]

Wells is not, of course, referring directly to Galton, but it remains intriguing that of the two of them, it's the author of *The Invisible Man* who is calling for science to present itself seriously, and the author of *On the Anthropometric Laboratory at the late International Health Exhibition* who is throwing around the idea of alien ants. Nowhere in his 'Human Evolution' article does Wells lapse into fiction in the way in which I have argued Galton does. But of course, Wells had the considerable luxury of being able to do that elsewhere. His argument about 'Human Evolution' may make reference to 'Professor Weissmann's destructive criticisms of the evidence for the inheritance of acquired characters', but it also deploys Wells's own fictional writing in support of its case:

> …in this view, what we call Morality becomes the padding of suggested emotional habits necessary to keep the round Palæolithic savage in the square hole of the civilised state. And sin is the conflict of the two factors–as I have tried to convey in my *Island of Dr. Moreau*.[46]

I have already mentioned that the *Fortnightly* had been the first periodical to adopt a policy of signature. At the end of this article, though, its author is credited not only with his name, but as 'H. G. Wells. (author of *The Time Machine*, *The Wonderful Visit*, &c., &c.)' (p. 595). Listing an author's other works in this fashion below the signature was unusual for the *Fortnightly*, and no other authors in that issue were signed with anything more than their names. It seems likely that Wells or, at least, Courtney, believed that the essay would derive real credibility by association with the famous scientific romances.

[45] Wells, 'Popularising Science', p. 301.
[46] Wells, 'Human Evolution', p. 594.

Well's reputation for fiction, in other words, bought him a certain latitude to consider genuine scientific ideas. The converse was equally true: Wells's series of 'Stories from the Stone Age', which began publication in the *Idler* seven months after 'Human Evolution' appeared, are adventure tales (not considered sf by the Bleiler index) which, despite their very different tone and publication venue, are closely linked to the *Fortnightly* piece, their imaginative world powered by the scientific ideas which Wells had soberly laid out in 'Human Evolution'.[47] The opening paragraph of the first tale, with its description of an alien landscape (the geological past) which is also known intimately to the implied reader (the English countryside), is also a textbook example of the kind of cognitive estrangement which was, for Darko Suvin, one of sf's defining features:[48]

> In that remote age the valley which runs along the foot of the Downs did not exist, and the South of Surrey was a range of hills, fir-clad on the middle slopes, and snow-capped for the better part of the year.[49]

Once again, the point is not to quibble about whether or not this tale can be defined as sf, but rather to demonstrate that, much like Galton, Wells is using popular science and popular fiction to support each other. The only difference is that he insists on dividing them into separate pieces of writing in order to do so, whilst Galton happily amalgamates the two in one article.[50]

As for Wells's engagement with the favourable opposition of Mars which so piqued Galton's interest, we need look no further than one of his most famous works, which began its run in *Pearson's Magazine* five months after 'Intelligible Signals' was published and whilst the 'Stories from the Stone Age' were still appearing in the *Idler*. *The War of the Worlds* is so indebted for its inspiration to

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[47] H. G. Wells, 'Stories of the Stone Age: Ugh-lomi and Uya', *The Idler*, 11 (May 1897), 418–29; H. G. Wells, 'Stories of the Stone Age: Ugh-lomi and the Cave Bear', *The Idler*, 11 (June 1897), 586–94; H. G. Wells, 'Stories of the Stone Age: The First Horseman', *The Idler*, 11 (July 1897), 736–44; H. G. Wells, 'Stories of the Stone Age: The Reign of Uya the Lion', *The Idler*, 12 (August 1897), 4–11; H. G. Wells, 'Stories of the Stone Age: The Fight in the Lion's Thicket', *The Idler*, 12 (November 1897), 430–37.

[48] Suvin, pp. 7–8.

[49] Wells, 'Ugh-lomi and Uya', (p. 418).

[50] Similar comparisons could be drawn between *The Time Machine* (1895) and Wells's article on 'Zoological Retrogression' in the *Gentleman's Magazine* (1891) – the former imaginatively spun out of some of the thoughts about human degeneration raised in the latter.

the 1894 (unfavourable) opposition that it references a real article which had appeared in *Nature* in August of that year on its second page – again, nonfictional scientific writing directly stimulates and powers a fantastical narrative.[51] Whether or not Wells had read Galton's piece at this point,[52] it remains interesting that the book which he wrote in response to the Mars craze was fundamentally a story about humanity being on the receiving end of transmissions from the red planet – and more interesting still that like Galton, he makes use of the newspaper format as a way of conveying those transmissions to the reader. Aaron Worth, in the course of showing how willing the human characters in the book are to mistake the Martians' invasion moves for attempts at communication, has drawn attention to the fact that the newspaper describes the first space capsule which lands on Horsell Common as 'A MESSAGE RECEIVED FROM MARS'.[53] The similarity of this headline to Galton's 'COMPLETE DECIPHERMENT OF THE FIRST PART OF THE MESSAGE FROM MARS' is striking,[54] and the resemblance between the two texts increases when, in *The War of the Worlds*, a deputation approaches the capsule:

> [I]t had been resolved to show [the Martians] that we too were intelligent by approaching them with signals.[55]

Fluttering a white flag, another supposedly universal gesture (as flawed in that respect as any of Galton's), the deputation is vaporised by the Martian heat-ray, a technology which, as Worth observes, is a deadly counterpart to the heliographs which the British soldiers on the common use to communicate with each other.[56] These devices were very similar to the heliostats which Galton had a role in inventing, his experience of which had first led him to advance the notion of sun signals as a way of sending messages to Mars. Pointing out that they were

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[51] H. G. Wells, 'The War of the Worlds', *Pearson's Magazine*, 3 (April 1897), 363–73 (p. 364).
[52] He had certainly read it by 1900, for it is directly referenced in *The First Men in the Moon*, whose heroes attempt a similar means of algebraic communication with the Selenites. This is yet another example of Galton's non-fiction resonating with popular culture – and it is treated as non-fiction in Wells's narrative, described as a 'paper', with no hint given of its fantastical or narrative components (H. G. Wells, 'The First Men in the Moon', *Strand Magazine*, 21 (March 1901), 279–90 (p. 281); McLean, pp. 132–33).
[53] Aaron Worth, 'Imperial Transmissions: H. G. Wells, 1897-1901', *Victorian Studies*, 53 (2010), 65–89 (p. 72); Wells, 'War of the Worlds' (April 1897), p. 370.
[54] Galton, 'Intelligible Signals', p. 659.
[55] H. G. Wells, 'The War of the Worlds', *Pearson's Magazine*, 3 (May 1897), 486–96 (p. 488).
[56] Worth, pp. 70–71.

seldom deployed by the British in anything but a colonial context, Worth argues that an implied association between signalling devices and weapons technology is part of how *The War of the Worlds* undertakes its critique of the British imperial project (p. 70).[57] Galton's heliostat, invented for use in Africa in the 1850s, is certainly not innocent of this association.

Though it is tempting to draw direct links between Wells and Galton in the light of these similarities, they are useful more because they demonstrate the authors' joint involvement with popular culture. As well as subjects which might be 'in the air' at any given historical moment – the opposition of Mars, for instance – both were also subject to (or, it might be better phrased, successful because of their engagement with) more general trends when they wrote science for the periodical press. The popular science writer, the career journalist, and the career scientist are categories which run into each other in the 1890s. The diversity of science writing, Peter Broks argues, 'makes a nonsense of any attempt to construct a single 'type''.[58] His study of popular science attempts to stress this miasma rather than delineating a more hierarchical model of influence, arguing that:

> We should no longer see the media as a means of communication with popular science as its end product, but rather as a system of representations encompassing what was both popular and scientific.[59]

Galton and Wells represent opposite sides of Broks's cautious division of writers of popular science into 'those who were brought to science writing through their scientific activities […] and those who came to it through their literary activities' (p. 30). The correspondences between them, despite the fact that they represent these apparently opposite camps, seem to confirm Bernard Lightman's declaration that:

> …we cannot adopt the positivist diffusion model as a heuristic guide to research because it uncritically assumes the existence of

[57] I engage more fully with the colonial dimensions of this subject in chapter 4.
[58] Peter Broks, *Media Science Before the Great War* (Basingstoke: Macmillan, 1996), p. 30.
[59] Broks, p. 131.

> two independent, homogenous cultures, elite and popular, and forces the latter into a purely passive role.[60]

Arguing that the key role of popularizers was 'to present the huge mass of scientific fact in the form of compelling stories', Lightman too shows that fiction need not necessarily be read as opposed to science when the two appear alongside each other (p. 188).

A rather different article about communicating with Mars shows another side of this relationship. Whilst *The War of the Worlds* was appearing in *Pearson's Magazine*, W. T. Stead's quarterly journal of psychical research, *Borderland*, published a four-page item called 'News from Mars'. Written, like much of the magazine, by Stead himself, this piece offers a summary of the experiences of a medium called Mr Starling, who claims to have been receiving telepathic communications from a resident spirit of Mars named Silver Pearl. Starling's was very far from the only account which linked parapsychology to Mars around the turn of the century, and, as Robert Crossley has shown, many mediums and their interlocutors were drawn to the blend of fact and fantasy which Mars represented.[61] Stead's article makes the role of fiction in this mix particularly explicit: though Starling provides spirit photographs of some Martians (disappointingly human in appearance), they are upstaged on *Borderland*'s page by a large reproduction of one of Warwick Goble's famous illustrations of the terrifying Martian tripods from *The War of the Worlds* which Stead has set opposite them (Fig. 1.4). Stead's piece begins with a summary of Mars in literary culture, moving from a mention of George Du Maurier's recently published novel *The Martian* via a discussion of Wells straight into a report

> …to the effect that Mrs. Burbank, one of the most noted of the Australian psychics, has been told by her invisible friends that the fauna of Mars include such creatures of the imagination as winged horses.[62]

The transition from literature to Stead's pet subject in *Borderland*, the spirit world, comes without so much as a paragraph break. This, together with phrases

[60] Bernard Lightman, '"The Voices of Nature": Popularizing Victorian Science', in *Victorian Science in Context* (Chicago: University of Chicago Press, 1997), pp. 187–211 (p. 189).
[61] Crossley, chap. 7.
[62] [Stead], 'News from Mars', *Borderland*, 4 (October 1897), 406–09 (p. 406).

like ‘creatures of the imagination’ and the equality of footing which the layout gives to fictional illustrations and ‘real’ spirit photographs, suggests that, like the editors of the *Fortnightly*, Stead had no problem with using fiction as a source of scientific authority – indeed, that he struggled to draw a distinction. This is unsurprising, given that occultism owes much more to literature and the imagination than it does to the scientific method, but it remains arresting that when the article distorts an expert’s views on the promise of spectroscopy into an endorsement of the spiritualist project, the expert is Tennyson rather than, say, Lord Kelvin.[63] One possible explanation for the reliance on literary sources is that Stead proposes the existence of a larger, more intuitive and, crucially, more *narrative* truth, one which science denies. In a revealing sentence, seeking to distance himself from fully endorsing Starling’s claims, Stead says:

> The fact that communications have been received cannot even be doubted by the greatest sceptic, but when we ask as to the truth of their origin we are confronted only with a blank wall.[64]

The distinction between *fact* and *truth* implied by this passage hints at a rather different interpretation of the distinctions between literature and science. Provable reality is now a mere fact, with the unbridled power of ‘the speculative mind of man’ (Tennyson’s, in this case) easily able to transcend it (p. 406). This explains why Stead may want to keep his distance from explicit Martian testimony offered by Starling: science may one day prove that Mars is uninhabited (or inhabited by creatures dissimilar to those reported by Silver Pearl), and the wider ‘truth’ of spiritualism needs to be safeguarded from the possibility of this empirical disavowal. General, rather than specific truth, is the sand on which Stead needs to build.

Refusing to separate novels from spiritualist escapades (referring to both as ‘stories’), Stead implies that an essential, non-specific truth obtains equally in the work of Wells, du Maurier, and Starling. Later in the article, Stead finally mentions a scientist when he relates that, according to Starling:

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[63] ‘Probably most persons will agree in regarding these communications as a confirmation of Tennyson’s judgment’ – this judgment apparently being (Stead quotes Tennyson’s son) ‘that the spectroscope was destined to make much greater revelations even than it it already made’ ([Stead], ‘News from Mars’, p. 406).
[64] [Stead], ‘News from Mars’, p. 406.

> Almost everything is done by electricity in Mars, and Silver Pearl stoutly declares that all Mr. Edison's discoveries are the result of impressions communicated to his brain by emissaries from Mars.[65]

Here, indeed, is an alternative explanation for the endurance of Mars in the public imagination. All the interest in the red planet could itself be the consequence not of Schiaparelli, or of the favourable oppositions, or of writing and speculation in the periodical press, but itself a form of psychical communication from outside; a wordless, intrinsically intelligible message from another world. This makes *Borderland*, in Stead's assessment, do the same work as Galton's imaginary newspaper; whilst Galton theorises about interplanetary communication in the popular press, Stead fantasises that it is actually taking place.[66]

Despite their very different approaches to the question of evidence, 'Intelligible Signals' and 'News from Mars' have significant correspondences. Narrative is, in both, a kind of authority source; and both are, rather despite themselves, equally indebted to the trends *around* science in the popular culture from which they emerged. The important difference is that 'News from Mars' believes itself to be a report of literal truth, whilst 'Intelligible Signals' is up-front, at Galton's insistence, about its fantastical side. But both are also ultimately pieces of writing which capitalise upon fiction in order to advance a specific view about the location of truth – they are alike in their engagement with the imaginative work of popular culture in the attempt to persuade their readers.

Fiction is regularly conceived of as being opposed to fact. In Stead's 'News from Mars' we see this opposition in its most worrying form, fiction called upon as an authority source in declaring a highly dubious vision of the world literally true. But Galton and his contemporaries show us that fiction in its various forms was also a key component not only in the communication of scientific ideas but in their production and development as they moved across the various discourses of the periodical press. Wells and Galton share the tacit understanding that their audiences live in, and relate themselves to, a narrative world. Stead fantasises that reality is synonymous with narrative, Wells takes

[65] [Stead], 'News from Mars', p. 408.
[66] I return to Stead's interest in the occult, and the location of truth, in chapter 3.

reality as the cue for his speculative writings, and Galton sees in narrative the opportunity to further his thinking about the real world. For none of the three are fact and fiction straightforwardly antithetical to each other.

In the introduction, I remarked that one of the reasons for my *fin de siècle* focus was that category boundaries were more mutable at that time. But in fact, the sense that science can be more effectively communicated when allied to popular culture still has a great deal of currency. Presenting a recent BBC television show which discusses the possibility of life on Mars (a subject which never really ceased its hold on the public imagination, and whose chief hope is apparently not altogether extinguished even now) Professor Brian Cox describes gravity as 'a force that surrounds us, and penetrates us, and binds the galaxy together' – an almost direct quotation from *Star Wars*.[67] In this nod toward one of the monoliths of present-day popular fiction, Cox displays the same glee and enthusiasm detectable in Galton's asides about mad millionaires on the red planet, and hints at the same seductive qualities of the unknown. It is this enthusiasm, and the imagination towards which it gestures, to which I turn in this chapter's final section.

IV. Wide-ranging Enthusiasm

Reading over the documents leading up to the publication of 'Intelligible Signals', one is left with a lasting impression of the verve with which Galton approached his subject. As well as the letters to the *Times* and the *Spectator* (1892), the idea also appears in a draft of a lecture called 'The Just-Perceptible Difference'. When Galton gave the lecture at the Royal Institution on the 27th of January, 1893, he omitted a section called 'Signals' which contains an early form of his 'Intelligible Signals' system and gives us insight into how the idea looked four years before he published it. The draft document of this section, preserved in the Galton Archive at University College London, is further testimony to the fact that Galton returned to the project repeatedly over four years, experimenting with various different formats and approaches to laying it before the public. One of

[67] Michael Lachmann, dir., 'Aliens', *Wonders of the Solar System* (BBC Two/Science Channel, 2010).

the striking consistencies across these different drafts and formats is Galton's tendency to characterise the idea as a caprice, even to himself. In 1893, it was 'the idle moment of a summer ramble' he took advantage of in order to devise geometric problems for his communication system; his renewed interest in 1896 was the consequence of 'being unable to occupy myself otherwise than in a desultory way' whilst vacationing at the hot baths of Wildbad.[68] Something of this holiday spirit perhaps survives in the restrained glee detectable behind some of the narrative eddies of 'Intelligible Signals'. The sense that Galton is enjoying himself is an important aspect of his writing, for the communication of that sense to a wider audience remains, for many, a defining feature of good popular science. The other most immediately striking characteristic of the essay is the audacious breadth of Galton's thinking: the signalling project alone touches on mathematics, linguistics, astronomy and physics; this chapter has argued that fiction can be added to the list; his discussions of heliographs were dependant on his experiences in Africa and his book on *The Art of Travel*; today, he is remembered for his contributions to statistics, anthropology and meteorology, to say nothing of his founding role in the field of eugenics. The areas I have touched on here by no means form an exhaustive list of his interests. The acuity of his thinking in any one of these subjects may debateable, but for the purposes of this chapter the fact that he immersed himself in so many different forms of knowledge is much more important than how successful he was in doing so. Galton's enjoyment of his subject and the diversity of fields through which he is prepared to pursue it come together in the slightly hackneyed phrase 'wide-ranging enthusiasm', which I here apply (somewhat rebelliously) as a technical term: it is this combination of characteristics which makes Galton himself, as well as the article in the *Fortnightly*, a useful model for exploring the relationships between different fields of knowledge.

As I noted earlier, 'Intelligible Signals' represents only a footnote to its author's enormous and varied career – this chapter's close focus on one quite short article is not the product of an assumption that it represents a paradigmatic example of popular science (it may not even represent a paradigmatic example of the work of Francis Galton). Rather, I have concentrated on the article because it provides such a useful crucible of the issues which arise when a scientist writes

[68] Galton, 'Signals', p. 23; Galton, 'Intelligible Signals', p. 658.

for a general audience, arguing that studied both individually and in comparison with other work published in the periodical press, 'Intelligible Signals' illuminates the many senses in which fact and fiction are not necessarily at odds. This point has been made on broader ground than that of my very specific example by Robert Crossley's book-length literary history of Mars, which demonstrates that for much of history, especially since 1877, the red planet has been a recurrent site for the blurring of the lines between fiction and fantasy.[69] Much of this blurring, says Crossley, is the consequence of the pull Mars exerts on the imagination, the ultimate cause of the 'Mars craze' which provoked Galton's article and so much besides (pp. 7-8). In this final section, I suggest that Galton's appeal to the imagination not only implicitly unites science and fiction but also uses the sphere of popular consciousness to invite a sympathetic understanding of the relationships between a host of academic disciplines, including literature and science. Seen this way, I argue, the Martian communication scheme is the emergent consequence of Galton's broader enthusiasm for the bringing together of disparate fields of intellectual enquiry before the eyes of the public.

Underpinning many of Galton's efforts to popularise science, both in articles and in public lectures, is an implied argument about what today's university administrators would describe as 'impact'. This is expressed superficially in the 'practical bearings' of his less outrageous schemes, which he is at pains to emphasise;[70] we see it as an animating influence behind the decision to express most of 'Intelligible Signals' as fake newspaper extracts, couching the mathematical and linguistic concepts of Galton's signalling mechanism in a medium with which many of his readers might have been more familiar (and doing much besides, as I have argued here). But the use of Mars itself, at a time shortly after the craze provoked by the favourable opposition, hints at another way in which Galton presents science to the public in terms of day-to-day relevancy: his continuous referencing of contemporary events. If Galton was, as the evolution of his signalling idea testifies, subject to the ebb and flow of public interest, he also sought to capitalise upon it, introducing his audiences to new concepts by showing them at work in familiar situations.

[69] Crossley, p. 89.
[70] Francis Galton, 'The Just-Perceptible Difference', 1893, p. 8, 154A, The Galton Papers, UCL Library Services, Special Collections.

A recurring theme in all of Galton's writing quoted in this chapter, telegraphy demonstrates this point nicely. Though it has dwindled as a source of imaginative inspiration in the intervening years (compared at least to Mars), Peter Broks points out that in the *fin de siècle* '[a]chievements in telegraphy […] were as exciting and as promising as those in flight'.[71] In his study *Telegraphic Realism*, Richard Menke has drawn attention to the dramatic effect of this media revolution on fiction at large:

> …these instruments offered figures for the connections of interest and intersubjectivity that linked the members of a society, and for the multifarious networks of relation often postulated by Victorian literary realisms.[72]

The periodical press in particular was full of telegraphy, whether it was the idea of wireless signals between ships at sea ('…no longer the dream of the scientist. It is an accomplished fact', wrote Herbert C. Fyfe in *Pearson's Magazine*)[73] or the dramatic new possibilities opened up by vast cables connecting continents: 'The most interesting of all maps', wrote J. Henniker Heaton in the *Fortnightly*,

> is a cable chart of the world. It is like a dissection of the nervous system in the body. From the brain, England, the cables branch out into every country […]. The human race is, as it were, in a vast whispering gallery.[74]

As well as being full of telegraphy, the periodical press was in a sense 'made of' telegraphy: the 'vast whispering gallery' had had dramatic effects on the production of newspapers and magazines. These effects were both material, allowing articles to be cabled in from vast distances almost instantly, and metaphorical, as W. T. Stead reveals in this piece of wisdom offered to a young copy-editor:

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[71] Broks, p. 101.
[72] Richard Menke, *Telegraphic Realism: Victorian Fiction and Other Information Systems* (Stanford, CA: Stanford University Press, 2008), p. 6.
[73] Herbert C. Fyfe, 'Signalling Through Space', *Pearson's Magazine*, 8 (July 1899), 114–22 (p. 114).
[74] J. Henniker Heaton, 'Postal and Telegraphic Progress Under Queen Victoria', *Fortnightly Review*, 61 (June 1897), 839–49 (p. 845).

> I had advised him as a remedy against the besetting sin of all young journalists, verbosity, never to send any copy into a newspaper until he had imagined he had to telegraph it to Australia at a dollar a word, and had struck out every superfluous word to save his dollars.[75]

By being 'promising' as well as 'exciting', the telegraph invited optimistic speculation about the future of both applied science and Empire. The 'vast whispering gallery' is a utopian vision of a unified earth – future societies envisaged in the periodical press are seldom without something like a telegraph, even when almost no other novum is described.[76] In short, the spread of telegraphy was provoking popular imagination in many of the same ways as sf. It was also enabling the transmission of stories – both physically, and by providing authors with a new metaphor on which to draw. In short, the very notion of 'signalling' when Galton was writing was as hot a topic as Mars itself; the pictorial component of the sun signals idea had its origin in his 'Just-Perceptible Difference' scheme to send pictures over the telegraph.[77] 'Intelligible Signals', seen in this context, doesn't so much envisage a communications breakthrough as the possibility of extending the telegraph system into outer space.[78]

Galton's engagement with contemporary enthusiasms can also be observed in a remark at the end of 'Intelligible Signals' that the decipherment of his code would require 'a small fraction of the care and thought bestowed, say, on the decipherment of hieroglyphics'.[79] This is the same conclusion which he reaches in the last sentence of the 'Signals' lecture draft: the solution would take 'an amount of effort that would be trifling to that which has, for instance, been spent on hieroglyphics'.[80] That Galton preserves this concluding rhetoric across nearly four years (and that it survived the numerous other changes which the idea underwent in the meantime) is a telling indication of his eagerness to capitalise

[75] Stead, 'My System', p. 296.
[76] E.g. Robert Barr, 'The Revolt of The-', *The Idler*, 5 (May 1894), 357–69 (p. 357). I return to imagined futures in chapter 2, below.
[77] 'Let us bear two facts in mind, the one is that a very large quantity of telegraphic information is daily published in the papers, anticipating the post by many days or weeks. The other is that pictorial illustrations of current events of a rude kind, but acceptable to the reader, appear from time to time in the daily papers. We may be sure that the quantity of telegraphic intelligence will steadily improve and be more resorted to.' Galton, 'The Just-Perceptible Difference', p. 7.
[78] For a related (but distinct) comment on Wells's use of the telegraph in *The War of the Worlds*, see Worth, p. 78.
[79] Galton, 'Intelligible Signals', p. 664.
[80] Galton, 'Signals', p. 24.

on the fame of the 'decoding' of the ancient Egyptian language. Like hieroglyphics, the sun signals to Mars occupy the grey area between language and code, but the comparison, on Galton's part, is also another quite deliberate engagement with yet another popular trend.

In the final version of 'The Just-Perceptible Difference', there's a moment where Galton uses an even more ubiquitous practice – reading itself – to link the worlds of matter and feeling:

> It happens that although most persons train themselves from childhood upwards to distinguish imagination from fact, there is at least one instance in which we do the exact reverse. Namely, in respect to the auditory presentation of the words that are perused by the eye. It would be otherwise impossible to realise the sonorous flow of the passages, whether in prose or poetry, that are read only with the eyes…[81]

Galton understands silent reading as an essentially imaginative act, and his insistence that this applies equally to 'prose or poetry' implies a connection not just between imagination and perception (the principal argument of the lecture) but also between the various subcategories of writing. It's crucial that Galton regards this connection as situated primarily in the mind of the reader, and specifically in their imagination. Mars, the telegraph, hieroglyphics: it was the *imagination* to which all of these things really appealed. Mars, in particular, demanded imaginative attention precisely because so little was known about it (Fig. 1.5; I return to this idea in chapter 3). It was attractive because its malleability to personal interpretation excited the reader's imagination, as Stead's piece so forcibly reminds us. In evoking Mars, Galton is doing more than demonstrating the 'impact' of science; he connects science intrinsically to the everyday not just via material association but by an appeal to imaginative curiosity, an instinct underpinning both science and fiction. To return to my example of a present-day popularizing scientist, Brian Cox said of Carl Sagan in a 2010 radio interview that:

> That sense of, sense of wonder – it's a cliché in a way, but you hear it, you know, it suffuses everything Sagan did. And it's important, and I think it knows no boundaries when you're a kid. I

[81] Galton, 'The Just-Perceptible Difference', p. 4.

> mean I couldn't separate, I didn't care to separate science fiction from science fact. For me it was, it was my imagination, just reaching out to other worlds.[82]

This emphasis on 'knowing no boundaries', on demonstrating universality, is as evident in Cox's documentaries as in Galton's writings. His television programme *Wonders of the Solar System* is a lengthy exposition of the similarities between Earth and the other planets and moons which orbit the sun, stressing repeatedly the central idea that the same laws of physics apply everywhere; that experiments on subatomic particles on Earth can accurately predict happenings in the most distant galaxies.

It is significant that the 'cliché' of wonder is the key to Cox's early involvement with science, and that the concept is given such prominence in the title of *Wonders of the Solar System*. The term is perhaps widely considered unscientific now, but in her introduction to the collection *Literature and Science*, Sharon Ruston points out that 'wonder' and popular science have long been closely connected:

> Often stemming from Darwin's final passage of *Origin of Species*, where he declares upon contemplating the entangled bank, "there is a grandeur in this view of life," popular science writers have made it their career to enthuse the public with a sense of wonder at the natural world.[83]

In his popular history of early nineteenth-century science, Richard Holmes emphasises the unitary power of this idea:

> Romanticism as a cultural force is generally regarded as intensely hostile to science, its ideal of subjectivity eternally opposed to that of scientific objectivity. But I do not believe this was always the case, or that the terms are so mutually exclusive. The notion of *wonder* seems to be something that once united them, and can still do so.[84]

The book is called *The Age of Wonder*.

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[82] 'Carl Sagan', *Great Lives* (BBC Radio 4, 2010).
[83] Sharon Ruston, ed., *Literature and Science*, (Cambridge: D. S. Brewer, 2008), p. 6.
[84] Richard Holmes, *The Age of Wonder* (London: Harper Press, 2009), p. xvi. Original emphasis.

It seems appropriate, then, that one index of Victorian periodicals lists an editorial goal of *Pearson's Magazine* as being 'to create wonder about the ordinary and tell a good story'.[85] C. A. Pearson was a staunch populist, and his magazine had little in common with the intellectual *Fortnightly Review*,[86] but with Suvin's concept of cognitive estrangement, it isn't hard to locate the rationale behind Galton's article, and science fiction generally, in the two halves of that proposition: 'wonder about the ordinary' and 'a good story'. It also serves to connect all of the other superficially disparate modes of writing which *Pearson's* published: reviews, interviews, other kinds of fiction, opinion pieces and, of course, popular science. Galton uses 'wonder' himself in a passage from which this chapter has made much hay – Mars begins to signal 'to the wonderment of our astronomers' – but, more importantly, his wide-ranging enthusiasm, methods of narration and subjects of discussion seem to indicate that he too believes not only that all these different things can be linked, but that the imagination, aided by a 'good story', is the 'simplest way' to link them.[87]

This idea of unifying intellect provides one possible explanation for Galton's wildly tangential reference to the 'gigantic folly' of the Tower of Babel.[88] It also makes 'Intelligible Signals' seem more suited than ever to the *Fortnightly Review*, a publication with a founding mandate to 'encourage, rather than repress, diversity of opinion, satisfied if we can secure the higher uniformity which results from the constant presence of sincerity and talent'.[89] Mark W. Turner has stressed the magazine's emphasis on this diversity, writing that:

> The *Fortnightly* – by blending the discourses of 'high' and 'low' culture, by placing a philosophical review article alongside an instalment of a serial novel – would have sent conflicting signals to the periodical-reading public: two shillings fortnightly instead of one shilling monthly, fiction alongside serious review-like articles. Where was the *Fortnightly* to be read: in the club, the drawing room, or the study?[90]

[85] Barbara Quinn Schmidt, 'Pearson's Magazine', in *British Literary Magazines*, ed. by Alvin Sullivan (Westport, CT: Greenwood Press, 1984), 310–13 (p. 311).
[86] For more on Cecil Arthur Pearson and the founding of his magazines, see Sidney Dark, *The Life of Sir Arthur Pearson* (London: Hodder and Stoughton, 1922).
[87] Galton, 'Intelligible Signals', p. 658.
[88] A. S. Byatt, *The Biographer's Tale* (London: Vintage, 2000), p. 238.
[89] *Fortnightly Review*, 1 (1865), inside cover.
[90] Turner, *Trollope and the Magazines*, p. 106.

Just as the *Fortnightly* appears to Turner stuck between social and domestic space, Galton's article exists somewhere between popular science, science fiction and journalism. My contention, however, returning to a point I made in the introduction to this thesis, is that both magazine and article occupy their liminal spaces to great effect, using them to empower the coexistence of apparently opposed areas of culture and politics.

'The perceived need from within the literary sphere to distinguish between factual and fictional writing', Matthew Rubery argues, 'arose in part from the mutual dependence on narrative in its most fundamental sense as a way of telling a story'.[91] Narrative is a language which we all speak – the closest we ever really get, perhaps, to intrinsic intelligibility. Peter Broks, whom I have already quoted arguing that the media should be examined less 'as a means of communication' and more 'as a system of representations', offers an understanding which could also be usefully applied to Galton's sun signals, which are perhaps also better described as 'a system of representations' than as a language.[92] Mathematical, algebraic, and, in their most sophisticated incarnation, pictorial, the signals are supposed to be building blocks of intelligible communication rather than a 'means of communication' in themselves. But this is ultimately an impossible goal according to Friedrich Kittler, who, in the assessment of James Mussell, urges us 'to resist reducing text to information and instead recognise its roots in the media that permit it to exist in the world'.[93] There are assumptive flaws in Galton's system; science cannot simply be passively transmitted as numerical data without being affected in some way by its medium. But Galton's idealised code transcends language by becoming entirely coextensive with its form; the medium not only shapes the message, it is the message. The article which conveys this idea is no more inert or passive than the signals themselves – its tone, structure, and situation in the periodical press all reflect a deep engagement with popular culture, one which produces meaning as well as conveying it. Narrative, seen from this perspective, might be considered just as legitimate a building block as algebra. Actively inviting the work of many imaginations, not just Galton's, for its effect, the article leads by example, showing science and fiction unified by wonder about ordinary, and a

[91] Rubery, p. 12.
[92] Broks, p. 131.
[93] Mussell, *The Nineteenth-Century Press in the Digital Age*, p. 18.

good story. It is convenient for this argument that Turner uses the phrase 'conflicting signals' in the passage quoted above: all writing gives off signals, usually less explicitly than Galton's, but this piece shows that 'conflicting signals', issuing from the body of a general magazine, needn't necessarily be contradictory ones. By its appeal to the imagination as an experimental space, Galton's wide-ranging enthusiasm hints at the science-fictional possibility of synthesising discourses as well as planets.

The situation as it stands today is well surmised by George Levine:

> The disciplinary divisions are almost absolute. Scientists don't talk to philosophers of science; philosophers of science don't talk to literary theorists; literary theorists – while implying their right through the study of language and discourse to tread on everyone's turf – seem not to talk to anybody but like minded theorists.[94]

For better or worse, debates like 'The Two Cultures' have, in the 116 years since Galton published his proposal, made his particular brand of wide-ranging enthusiasm a thing of the past. It is touching, therefore, to read in the closing sentences of his essay the most telling indication of his desire for intrinsic intelligibility: the assertion that communication between two civilisations would be possible only 'if they were both as far advanced in science and arts'.[95] Unifying the human race is one of sf's major themes, and Galton's prescription remains very relevant today. Before we try to talk to the aliens, it is still necessary to think about how we talk to each other.

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This chapter has built its argument for the interdisciplinary nature of *fin de siècle* periodicals on a close examination of one particular article. It is now time to widen and deepen the focus. Chapter 2 furthers my discussion of form by considering another material aspect of the periodical which seems actively to favour a cooperative relationship between science and fiction: its relationship to time.

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[94] George Levine, 'Looking for the Real: Epistemology in Science and Culture', in *Realism and Representation*, ed. by George Levine (Madison, WI: University of Wisconsin Press, 1993), pp. 3–23 (p. 15).
[95] Galton, 'Intelligible Signals', p. 664.

Chapter Two: Distance Over Time

I. On the Absence of the Future in Early Sf

This chapter's starting point is an observation by Sam Moskowitz in the preface to his anthology *Science Fiction by Gaslight*: 'The intriguing thing about these stories', he writes, 'is that, with few exceptions, the action occurs in the times in which the stories were written'.[1] The contemporary setting of the majority of early sf might be a surprise to readers who expect the genre to be necessarily engaged with futurity, but here I will argue that far from being oriented towards prediction, sf in this period routinely engages with the present day. This fact, I suggest, is closely related to the physical location of the majority of this fiction – the periodical press.

Moskowitz's assessment holds true of a far broader spectrum of 'gaslight' literature than the twenty-six tales which it introduces. The vast majority of sf enrolled from this period is set within a few years of the date it was written, or else at an unspecified date in a society which very closely resembled the author's. Naturally, there were exceptions to this – much of what is often called 'utopian literature', for example, is distinguished by its future setting. Even these works, though, draw their abiding concerns from a very specific sense of the here and now. Utopian literature, as Matthew Beaumont has demonstrated, 'dreams that the diffusion of its ideas in the present will create the conditions necessary

[1] Moskowitz, p. 12.

for instituting its ideal society in the future' – in other words, it exists to influence the politics of the present.[2] But this impulse aside, utopian literature also generally displays a marked reluctance to imagine the kind of technological change which is so interesting to much of the sf which retained a contemporary setting. Edward Bellamy's *Looking Backward: 2000-1887* (1888) imagines a very differently-organised Boston at the turn of the millennium, but restricts scientific innovation to a few incidental details and is keen to stress continuities between the two epochs in order to make Bellamy's utopian society appear achievable ('the differences between the style of dress and furniture of the two epochs are not more marked than I have known fashion to make in the time of one generation'[3]). By contrast, the *voyages extraordinaires* of Jules Verne, which thrive on technological novelty, are for the most part set in the present, the novum typically possessed by a single person or organization in an otherwise recognisable nineteenth century.

With the notable exception of *The Time Machine*, of which more later, all of H. G. Wells's major scientific romances of the 1890s have near-contemporary settings; his attempt to visualise the year 2000, *Anticipations of the Reactions of Mechanical and Scientific Progress upon Human Life and Thought*, on the other hand, appeared as a non-fictional 'series of papers' in the *Fortnightly Review* (a magazine whose publication of speculative scientific non-fiction was the subject of the previous chapter).[4] *Anticipations* based its vision of the future on developments in transport infrastructure, and constitutes a far more rigorous attempt to imagine a technologically distinct future than Bellamy's novel. Unlike *Looking Backward*, however, it entirely lacks central characters, dramatic tension, and plot. Considered attempts to predict the future (rather than influence its development in the utopian mode identified by Beaumont) seem to be the province of non-fiction.

On the first page of *Anticipations*, Wells takes the opportunity to rebuke what he calls 'Fiction of the Future', which, he says, 'pretty frankly abandons the prophetic altogether, and becomes polemical, cautionary, or idealistic, and a

[2] Matthew Beaumont, *Utopia Ltd.: Ideologies of Social Dreaming in England, 1870-1900* (Leiden: Brill, 2005), p. 194.
[3] Edward Bellamy, *Looking Backward: 2000-1887* (Boston, MA: Houghton Mifflin, 1889), p. 45.
[4] H. G. Wells, 'Anticipations: An Experiment in Prophecy', *Fortnightly Review*, 69 (April 1901), 747–60 (p. 747).

mere footnote and commentary to our present discontents'.[5] With the exception of the word 'mere', this is a sentiment with which I shall here set out an agreement. I shall do so by reading two examples of the rarer strain of sf which *does* portray a comprehensively imagined, definite future: Wells's *The Time Machine* and Rudyard Kipling's story 'With the Night Mail'. Like utopian fiction, these works manifestly draw their impetus from the present – but I will also show that it is a present specifically determined by the physical context of the magazines in which they made their initial appearances; that their location in periodicals significantly empowers their approaches to the passage of time. This is an argument which I shall make both by analysing their internal treatments of time and tense, which are closely connected to the periodical structure, and by reading other items which appeared in the same issues, showing the stories' external connections with their material context. These readings of Kipling and Wells form sections two and four of this chapter respectively. Section three examines a selection of non-fictional future-prediction pieces from the magazines, showing that these speculative writings also draw on their periodical surroundings for the substance of their approach to time as well as for their form and appearance. Having argued that both fictional and non-fictional writings about the future drew on a periodical conception of time rooted in ambiguity, I propose in the final section that this ambiguity has a political dimension. Science, fiction, and the periodical press in this period all share a distrust of the authoritarian voice which their joint approach to time provides them with a meaningful way of circumventing.

II. Time, the Periodical, and Rudyard Kipling's Worldbuilding

Laurel Brake has drawn attention to the fact that most of the works which we are accustomed to encountering as volumes made their first appearances in the pages of periodicals, the process of transition between the two constituting 'a principal model of authorship in nineteenth-century Britain'.[6] Mike Ashley points out that the popular magazine was not only 'the vehicle for the latest stories by

[5] Wells, 'Anticipations', p. 747.
[6] Brake, *Print in Transition*, p. 16.

the latest authors' but also 'the medium through which written tales passed on their way towards becoming books'.[7] These quotations emphasise two essential characteristics of periodical literature – novelty and ephemerality – and cast the periodical as a medium fundamentally embedded in the present tense. Distanced from the past by its highly contemporary associations, the magazine fades into obscurity as time passes and some of its constituents make their way into more durable volume editions.

Specific issues (and their contents) may be necessarily ephemeral, but *titles* can (if successful) be far less so. As James Mussell has pointed out, we seldom imagine titles as collections of issues, but as corporate identities whose characteristics are not necessarily well-reflected in the contents of any given instalment.[8] Periodicals are literally and metaphorically bound into a continuum whose identity each issue may contribute towards, but which is not necessarily paradigmatic of any one of them. In other words, a magazine 'title' describes not just the string of objects whose rhythmic publication constitutes a periodical's corpus, but also the metaphor underlying them, the metaphor which orders a potentially infinite succession of present tenses with their regular, serial appearance. Mark W. Turner comments on this, pointing out that 'the periodical stretches back in time whilst simultaneously projecting the future'.[9] Turner describes periodical time as complex, multi-layered, chaotic, and, above all, fundamental: 'The media has always both defined and been defined by temporal division'.[10] In other words, as its form runs implicitly into both without ever fixing itself in either, the periodical speaks to eternity in the present tense. This relationship to time – and specifically to tense, I shall argue here – is part of what makes the magazine such fecund ground for sf.

Tenses play an important role at a textual level in Rudyard Kipling's 'With the Night Mail', a short story which first appeared in America in the November 1905 issue of *McClure's* and made its British debut in the following

[7] Ashley, *The Age of the Storytellers*, p. 3.
[8] 'We treat the title of a periodical or newspaper as if it names a single, coherent work and treat individual issues as if they manifest this corporate identity. However, as the definition of the work depends on the material artefacts that document it, the identity of the work changes with the publication of every issue' (Mussell, *The Nineteenth-Century Press in the Digital Age*, p. 10).
[9] Mark W. Turner, 'Periodical Time in the Nineteenth Century', *Media History*, 8 (2002), 183–96 (p. 192).
[10] Mark W. Turner, 'Time, Periodicals, and Literary Studies', *Victorian Periodicals Review*, 39 (2006), 309–16 (p. 311).

month's *Windsor*. The piece describes a voyage across the Atlantic in a future where the invention of extremely efficient airships has not only revolutionised transport but also, by extension, ushered in a benign world government – the Aerial Board of Control, or A.B.C. – and an end to warfare. With its plethora of intricately-described inventions and its willingness to show them at work in various situations, the story is arguably a watershed moment for the emergent sf: though it is under-studied, Andy Sawyer notes, it is 'particularly important in science fiction because it does a number of things that many SF readers think such a story should do, it does them particularly well, and yet it reads with a particular strangeness to modern eyes'.[11] One of the 'things' to which Sawyer refers here is the story's sudden shift into the present tense, which Sawyer says enhances the tale's 'narrative immediacy'.[12] More than this, I believe that Kipling's use of tense in this story demonstrates profound connections to the periodical press – one which can also be traced in the piece's paratextual elements, its textual history, and its resonances with other pieces published in the December 1905 *Windsor*, especially with a particular work of popular science (Walter George Bell's 'A Journey Through Space'). This section explores these connections in detail.

'With the Night Mail' begins in an unobtrusive narrative past tense, to which any reader of fiction will be well accustomed:

> At 9:30 p.m. of a windy winter's night I stood on the lower stages of the G.P.O. Outward Mail Tower. My purpose was a run to Quebec in 'postal packet 162, or such other as may be appointed'…[13]

During the second paragraph, however, a transition takes place:

> From the Despatching-caisson I was conducted by a courteous and wonderfully learned official – Mr L. L. Geary, Second Despatcher of the Western Route – to the Captain's Room (this

[11] Andy Sawyer, 'Tales of Futures Passed: The Kipling Continuum and Other Lost Worlds of Science Fiction', in *World Weavers: Globalization, Science Fiction, and the Cybernetic Revolution*, ed. by Wong Kin Yuen, Gary Westfahl and Amy Kit-sze Chan (Hong Kong: Hong Kong University Press, 2005), pp. 113–34 (p. 117).
[12] Sawyer, p. 119.
[13] Rudyard Kipling, 'With the Night Mail', *Windsor Magazine*, 23 (December 1905), 52–66 (p. 52).

> wakes an echo of old romance), where the Mail captains come on their turn of duty. He introduces me to the captain of 162…[14]

By the end of this passage, the narrative has shifted smoothly to the present tense – and there it remains for the bulk of the story, not just for present-simple exposition work, where it might be expected ('Practically, the A.B.C. confirms or annuls most international arrangements, and, to judge by its last report, finds our tolerant, humourous, lazy little planet only too ready to lay the whole burden of private administration on its shoulder', p.63) but also when relating specific moments of action ('Our bow clothes itself in blue flame and falls like a sword. No human skill can keep pace with the changing tensions', p. 60).

On the story's final page, the narrative tense shifts back into the past simple with the same lack of ceremony as the first-page shift to present continuous, the change almost hidden amidst dialogue:

> 'Thirty years,' *says* George, with a twinkle in his eye. 'Are you going to spend 'em all up here, Tim? Our letters'll be a trifle discharged.'
> 'Flap along, then. Flap along. Who's hindering?' The senior captain *laughed*, as we *went* in.[15]

The fact that the tale is book-ended by the more traditional past-tense narrative, together with the inconspicuousness of the moments at which it shifts, and its tendency to drop back into the past at certain points (at one point for nearly a whole page) all support the conceit that the present tense narration emerges, on one level at least, with a degree of inadvertence; that the story's unusual narrative, perhaps even in spite of itself, crystallises out of the more standard past-tense mode in which it opens. Despite being set in the future, the story is very closely bound to the idea of contemporaneity by its disorienting apparent need to function in the present tense.

The present continuous is the tense of repetition; of a happening before, during, and after now. It is also, as we have seen, the tense of Turner's periodical, which stretches both forward and back from the current moment. 'With the Night Mail', then, evokes not only the present, but a specifically

[14] Kipling, 'Night Mail', p. 52.
[15] Kipling, 'Night Mail', p. 66. My emphases.

periodical present. We can see this in the content of the story as well as its grammar, for example in Kipling's condescending backward-references to the 'old romance' of the past (Kipling's reader's present).[16] In the parenthetical 'echo of an old romance' in the passage quoted above, then – at the very moment of the story's shift into the present tense – there is a retrospective glance at the present of 1905, evoking the imagery of the naval empire to which Kipling's aerial one is constantly addressed.

Another clue that the story is anchored to the present is the date of its setting. This is October 2147 in the *Windsor* publication – but in the American edition (*McClure's*, November 1905), the story is dated June 2025, 122 years earlier. When the story made the transition to book form in 1909, the date was changed again, this time to the more iconic year 2000. The variance in the story's date between published versions can be read as the macrocosmic parallel to the confused shifts of tense which take place on the narrative level, drawing attention back, like all those asides about the romantic, ancient past, to the far more stable timeframe of the story's composition, Kipling's present tense. Whatever the motivation for these changes – authorial or editorial – the fact that they were made when the three versions are otherwise virtually identical suggests, significantly, that the *specific* futurity of this thoroughly-constructed world is not its abiding concern.[17]

To put this differently, the date changes between the different versions because of alterations to the paratext of the story, rather than to the text itself. In its magazine appearances, the piece carried a dateline as part of the header, appearing just below the author's name and just above the actual text of the story (Fig. 2.1). 'Dateline', of course, is a word normally associated with print news – and in fact, this is exactly the sort of association which Kipling is hoping to make. In full, the line in the London version reads '*From 'The Windsor Magazine,' October, A.D. 2147*'.[18] It is therefore not just Kipling who looks forward, but the magazine itself; the story is an explicit manifestation of the

[16] Sawyer, p. 121.
[17] Sawyer, p. 272 note 14, glosses the superficial differences between the three texts. Sawyer has taken the volume edition as his preferred text, and therefore (writing in 2005) makes something of the millennial associations. I have favoured the *Windsor* version – the first appearance of the story before a London audience. However, as Sawyer also notes, there seem to be no substantive discrepancies between the actual texts of the different versions.
[18] Kipling, 'Night Mail', p. 52.

anticipation every issue of a periodical implicitly holds for its successors. The dateline is a small but crucial detail, since it uses the formal apparatus of the magazine to initialise Kipling's fictive universe – it is part of the story, but *looks* like part of the periodical. It alone tells us that the story is meant to be read internally as a magazine piece; that it is a simulated magazine article (October 2147) as well as a real one (December 1905). The dateline articulates the connection between the two by stressing that the publication – *Windsor* – is the same in both cases: Kipling links himself not to a generic, invented, far-future publication, but to a projection of the one in which his story is actually appearing. In its American appearance in *McClure's*, the dateline claims 'With the Night Mail' for that publication's future instead, ensuring that this sense of periodical continuity was preserved for readers on both sides of the Atlantic.[19]

Paratext and text complement each other so well that when the story appeared as a discrete book in 1909, it was evidently felt necessary to preserve a sense of the periodical. The title of the book version is *With the Night Mail: a story of 2000AD (together with extracts from the contemporary magazine in which it appeared)*.[20] This version lacks the dateline, but both elements from it which I have focused on – the date itself and the testimony to the supposed magazine appearance – have moved into the subtitle ('2000AD'; 'contemporary magazine'), which the story retained when it was collected in later editions of Kipling's work.[21] The reader of the book version is therefore immediately confronted with the fact that the text is supposed to be imagined as part of a magazine (now a generic, unnamed title, since there is no specific current periodical with which to establish a link). This is emphasised by the presence of what the title refers to as 'extracts' – an appendix of 'magazine sections' prepared by Kipling to replicate a serial context for his tale. These include the 'A.B.C. Bulletin' (air traffic news, including a mention of one of the incidents in the main story), notes and correspondence sections, a book review, and a diverting advertising supplement. The appendix is certainly a mechanism by which Kipling can allow 'the history and political superstructure of this world to be deduced' – an empowering device for constructing a fictitious world – but it is also a way of re-creating the 'feel' of a periodical in the reader of the book

[19] The American version of the story is in *McClure's Magazine*, 26 (November 1905), pp. 23-35.
[20] New York, NY: Doubleday, Page, & Co., 1909.
[21] For example, in Rudyard Kipling, *Actions and Reactions* (London: Macmillan & Co., 1927).

version.[22] It appears in neither of the story's original periodical publications; fake magazine paraphernalia are redundant when the real things abound (Fig. 2.2).

And the 'real things' of the *Windsor*, although not set in the same world as Kipling's story, turn out still to have a great deal in common with it. The first instalment of B. Fletcher Robinson's 'Chronicles in Cartoon: A Record of Our Own Times' was the item before Kipling's story in the December 1905 issue of the *Windsor*. Fletcher Robinson was the editor of *Vanity Fair*, and in this series of articles he reflects on that magazine's history and reprints a selection of its most eye-catching satirical artwork. Fletcher Robinson's tone is highly reminiscent of Kipling's repeated references to the past when he says of the year in which *Vanity Fair* was founded, 1868:

> At that period Society still preserved its inexorable barriers. Agriculture, if depressed, was a source of fair rentals to owners of land; the Kaffir market had not successfully bombarded the citadels of the British aristocracy. The Smart Set were mercifully wrapped in the mists that surrounded alike Mr. Sutro and the future.[23]

Like the sections of 'With the Night Mail' which evoke the 'ancientest traditions' of steamships, this is a passage which takes advantage of the past's ignorance of the present. The difference is that the *Windsor*'s reader is in the present of Fletcher Robinson's piece rather than the past of Kipling's narrative. Mimicking not only the tone of pieces like Fletcher Robinson's but also their implicit assumption that the reader is 'in on the joke' (that they know, for example, who 'Mr. Sutro' is), is part of the technique by which Kipling makes his world so convincing.[24]

Fletcher Robinson seems aware of this as he discusses the history of one magazine in the pages of another. He stresses that *Vanity Fair* has provided a continuous documentation of the changes which have taken place since 1868; that it is the 'Record of Our Own Times', the emphasis on the plural, a series of documentary present tenses in perpetuity. In printing the article, the *Windsor* provides the same reassurance: the article ends (unusually) with a short

[22] Sawyer, pp. 119–20.
[23] B. Fletcher Robinson, 'Chronicles in Cartoon: A Record of Our Own Times', *Windsor Magazine*, 23 (December 1905), 35–51 (p. 35).
[24] See also Sawyer, pp. 119–20.

advertisement for the next instalments: 'The foregoing article is the first of AN IMPORTANT SERIES'.[25] This piece, then, looks forward to its own looks backward, nicely encapsulating the periodical's ordering of time. 'With the Night Mail' doesn't just exist within the verbal structures of the periodical but actually depends on them for a significant portion of its affect. The mechanism which gives conviction to Kipling's future world is drawn from the periodical's approach to time and actuated by the material conditions of its circulation as part of a monthly instalment.

Also published in the December 1905 *Windsor* was Charles Livingston Bull's 'An Artist in Bermuda', a glance at which can reveal further links between Kipling's fiction and the magazine's journalism. Of the sea-bed in Bermuda, Bull writes:

> …garden it is, if any man-made word may be applied, for the great purple sea-fans sway backward and forward, waving their branches to the rhythm of the swell just as the pine boughs sway to the breeze. Huge sprays of coral are there, too; some of it star-shaped, some like the great antlers of a forest monster, and some as finely wrought as the most delicate lace…[26]

Compare this with Kipling's description of riding an airship above the clouds:

> At this level the lower clouds are laid out all neatly combed by the dry fingers of the East. Below that there is a strong westerly blow. Overhead, a film of southerly drifting mist draws a theatrical gauze across the firmament.[27]

Here we have a tourist's description of ocean life in Bermuda and a progenitor of science fiction, a tale of a future in which airships rule the skies – and the two have more in common than merely tone and tense. Both attempt to describe to their London audiences wonders which they might struggle to imagine, and of the two, it is Bull, not Kipling, who says of his subject that 'there seems to be nothing within the knowledge of man' comparable.[28] Moreover, both attempt to ameliorate their fantastical subjects by describing them as the travelogue of a

[25] Fletcher Robinson, p. 51.
[26] Charles Livingston Bull, 'An Artist in Bermuda', *Windsor Magazine*, 23 (December 1905), 78–83 (p. 80).
[27] Kipling, 'Night Mail', p. 54.
[28] Bull, p. 80.

first-person narrator, a narrator who gazes from above the world in order to comprehend it, looking down either through the water (in Bull's case) or through the air (in Kipling's).

'With the Night Mail' is a work of fiction, but the presence of the dateline insists that it is also supposed to resemble a non-fictional piece of magazine reporting. Once we realise this and place it back alongside some of the journalism with which it appeared, we can explain the tonal eccentricity of the piece and recognise how essential the tale's periodical format and appearance are to its sf worldbuilding strategy. Kipling, who had began as a journalist himself, was well positioned to understand the power of the article format as a tool for exposition.[29] The 'infodump' problem, with which sf authors still struggle – that is, the fact that no précis of the history of a future society or invention would ever be needed by one of its members – is neatly sidestepped by Kipling's invocation of a format which, at its heart, seeks only ever to describe the present to itself.[30]

Reading 'With the Night Mail' as an article also helps us understand its tendency to sacrifice plot in order to dwell on the technology in the airship and the histories of those who invented it. 'The story, first of all, is (although a number of exciting things happen) very little of a story': the mail ship rescues a vessel in distress, survives being buffeted by a storm, and interacts with other ships of various kinds, but the main thing it does is provide a vantage point from which the narrator can describe the ship and the world over which it sails.[31] The failure of any specific aspect of the narrative – biographies of the various inventors of airship technology, a burgeoning romance between one character's daughter and the captain of another ship, the political ramifications of a benign, technocratic world government – to rise to a position of prominence suggests that this is primarily an exercise in worldbuilding rather than storytelling.[32] 'With the

[29] An account of Kipling's early career is in Rudyard Kipling, *Something of Myself* (London: Macmillan & Co., 1937), pp. 36–57 especially.
[30] On 'infodump', see Sawyer, p. 119.
[31] Sawyer, p. 118.
[32] Kipling wrote a sequel, 'As Easy as A.B.C.' (*London Magazine*, March-April 1912), which tackles the dystopian nature of his future world much more squarely. As a result, critics since have tended to regard *both* stories as being about the world government – Bleiler's *Science Fiction: The Early Years* index entry for 'With the Night Mail' begins its synopsis by telling us that 'The A.B.C. (Aerial Board of Control) has authority over mail, traffic, and related matters', but this fact is far from essential to the understanding of the first story, which doesn't mention the A.B.C. until the twelfth of its fifteen pages. Roger Luckhurst, too, reads the first story as being primarily about the passing of democracy (*Science Fiction*, p. 45).

Night Mail' isn't just a breakthrough science fiction story which appeared in a magazine; it's a breakthrough science fiction story *because* it appeared in a magazine. Its wholesale adoption of the periodical's textual and paratextual architecture, which persists into (and is arguably reemphasised in) the book version, is the mechanism by which it presents its vision of a future world. At the same time, it enables the magazine title itself – *Windsor* or *McClure's* – to draw attention to its own hybridity; to shore up its own future, its indefinite, periodical continuum. Sf and the magazine's non-fiction style are more than co-present here: they are co-operative.

Having noted this co-operation, it is worth devoting some time to the position occupied by science. Another of the articles published in the December 1905 *Windsor* was Walter George Bell's 'A Journey Through Space', a popular astronomy piece, which focussed on the area of the sky towards which the Sun (and with it the Earth) is travelling. Bell spends some time explaining the history of how the astronomical calculation about the Sun's direction of movement was made and reproduces some large, quality photographs of nebulas. Once again, there are some remarkable textual resonances with Kipling's fiction, for example in its descriptions of subjective speed. Bell speaks of the solar system, including our own planet, as:

> …moving among the stars, at a speed which may sound enormous to our ears, yet is insignificant in the vast theatre in which the celestial motions take place, where space and time are infinite...[33]

Kipling's airships travel so smoothly, for all their speed, that they, like Earth in Bell's account, feel stationary:

> The hum of the turbines and the boom of the air on our skin is no more than a cotton-wool wrapping to the universal stillness. And we are running an eighteen second mile.[34]

Bell's conception of the Earth as a vessel, 'some magic chariot' journeying more or less toward the constellation of Hercules, prefigures the later sf concept of the

[33] Walter George Bell, 'A Journey Through Space', *Windsor Magazine*, 23 (December 1905), 111–15 (p. 111).
[34] Kipling, 'Night Mail', p. 57.

generation starship.[35] It also recalls not only the airship on which Kipling's narrator finds himself, but also of the way in which the periodical, issue by issue, journeys through time. Start and end points for this ship's journey are almost irrelevant – the Earth is moving in one direction, though its passengers can look in any. Most crucially, Bell points out that to any one generation the stars appear fixed; the vessel appears to its passengers, like packet 162, to be stationary. Earth's journey, like that of the periodical or Kipling's airship, is a constant succession of present tenses.

1905 was the year Einstein published 'On the Electrodynamics of Moving Bodies', the paper which proposed the special theory of relativity. Its repercussions for our experience of time are not ones which Bell could have prepared for, and, in part thanks to it, there is perhaps no branch of science to which tenses bring more anxiety than astronomy – one of whose roles, thanks to the speed of light, is to predict things which have already happened, often many millions of years ago. Einstein showed that there is no objective rate for the passage of time; that time, although progressing in one direction, can be bent and fluctuated by local phenomena, experienced differently by observers in different situations. It need hardly be added that Einstein's theory first appeared in a periodical, the journal *Annalen der Physik*: since at least the establishment of the Royal Society's *Philosophical Transactions* in 1665, the periodical has always been the primary venue of scientific progress, and so it remains. One reason for this, beyond the pragmatic, might be that the constantly self-revising present tense of the periodical matches a core ideology of science, which views itself as being only ever the best *current* explanation of the world, an always-completing process of understanding rather than a pre-existing body of knowledge:

[35] A generation starship is one which, owing to the distances involved and the impossibility of travelling faster than light, takes several generations to reach its destination; the crew which arrives are the descendants of the crew which left. Science fiction's many treatments of this theme include Arthur C. Clarke's 'Rescue Party' (1946), James Follett's BBC radio serial *Earthsearch* (1981), and Alastair Reynolds's *Chasm City* (2001). Generation ships are sometimes also worlds in their own right, or mistaken for them (as in, most famously, Robert A. Heinlein's 1963 *Orphans of the Sky*). For a full overview, see Peter Nicholls and David Langford, 'Generation Starships', *Science Fiction Encyclopedia*, 2011 <http://sf-encyclopedia.com/entry/generation_starships> [accessed 20 January 2012].

> In science, there are no universal truths, just views of the world that have yet to be shown to be false. All we can say for certain is that, for now, Einstein's theory works.[36]

In this sense, science is also something written in the present tense.[37]

On the eve of Bell's article's appearance, his understanding of time was about to be swept away by science's process of self-revision, giving way to a slightly more accurate understanding of the universe. It is perhaps appropriate, then, that his 'Journey through Space' turns out to be, in its final paragraphs, ultimately a journey through time. Bell speculates about the future, imagining a time 'when, owing to the Sun's journey, we shall not see all the stars dotted over the sky in their present perspective'. He then looks back, reminding the reader that the constellations we find so familiar at the moment would be unrecognisable to our distant ancestors: 'As in the future', he says, 'so in the past'.[38] 'Funny how the new things are the old things', says Kipling, in the same issue of the same magazine.[39]

III. Predicting the Future

Kipling is an exception, although an especially illuminating one: the majority of the *fin de siècle*'s visions of the future, as I mentioned at the start of this chapter, took the less contorted route of being present-tense non-fiction rather than mimicking it. As might be expected, these pieces came from a range of different perspectives and adopted numerous approaches to imagining the future. Few of them would ever be themselves enrolled as sf, but their tonal and physical similarities to material which would makes them intriguing. In this section, I briefly discuss a few of these non-fictional pieces, drawn from a selection of magazines, in order to demonstrate that their various considerations of the future were equal to Kipling's in their dependency on the form of the periodicals in which they appeared.

[36] Brian Cox and Jeff Forshaw, *Why Does $E=mc^2$?* (Cambridge, MA: Da Capo Press, 2009), p. xv–xvi.
[37] For more on how the present tense unites science and fiction, see Beer, *Darwin's Plots*, p. 43. For more on periodicals as 'more important than books to practicing scientists', see George Levine, 'Why Science Isn't Literature', p. 180.
[38] Bell, p. 115.
[39] Kipling, 'Night Mail', p. 64.

What is immediately striking about many of the magazines' predictions is their modesty. In a piece which ran in the January 1896 *Idler*, 'Mrs. Humphry' (Mary Augusta Ward) set herself to imagine the London of thirty-four years into the future. This passage is a representative extract:

> The florists of 1930 will not dream of using such a crude and hideous blue as that of the paper in which the flower dealers of to-day envelop the blossoms they sell. Look how the glorious tone-music of the fruiterers' windows is defaced and mutilated by the frightful brick-dust pink of the paper wrappings. Even oranges are encircled with it, the effect on the colourist being so discordantly clamorous that, if translated into sound, it would go far to deafen.[40]

Among Ward's other predictions are superior window draperies, prize-giving for well-decorated houses, and more agreeably-coloured omnibus tickets. Her most ambitious idea (and the only one which requires any measure of technological innovation) is that the 'complexity of disagreeable noises' which currently abound in the city might be harmonised:

> Why should not tram-rails be so constructed as to emit a deep and musical note to which itinerant vendors, newsboys, and omnibus conductors could attune their various cries?[41]

As the oratorical tone here suggests, Ward's piece does not really constitute a prediction of the future at all. Rather, it is an ambition for the present, a semi-satirical way of showing what could be if only people had taste. Like Bellamy's *Looking Backward*, this article's conception of the future is of a more 'sensible' civilisation rather than a more advanced one. Both assume that technological development will be the servant of change rather than its cause. The difference between Ward and Bellamy is that Ward's piece exclusively concerns aesthetic differences, and even then, only ones which harmonise the routine of city living. Her first sentence:

> The next few decades may be expected to be prolific in improvements, and as many of them will deal with the details of

[40] Mrs. Humphry [Ward], 'London in 1930: A Forecast', *The Idler*, 8 (January 1896), 572–75 (p. 573).
[41] [Ward], p. 574.

> daily life, we may, for our cold comfort, be permitted to indulge occasionally in a small day-dream of the wonders that will be…[42]

The key phrase here is 'daily life': as in 'With the Night Mail' ('[t]he physical form of its dominant technology has not changed its daily life'[43]), it is the repeated continuum of the present which is at issue here. This is materially emphasised by the fact that Ward's article is the last in a series of six which appeared in the *Idler* from August 1895 to January 1896 – subjects ranged from female bicyclists to the 'problem' of educated servants. The other five articles are more straightforwardly about the present day.

It is this pointed interest in the present which makes Ward's article (and, indeed, Bellamy's novel) so intriguing from the perspective of the study of sf. The idea that sf is meant to predict the future, according to *The Science Fiction Encyclopedia*, is '[t]he most widespread false belief about sf among the general public'.[44] It may be fair to say that, like sf, Ward is interested in possibilities rather than predictions, and on the final page of 'London in 1930', which is also the final page of her run of articles in the *Idler*, it is to the romance of possibility that she appeals:

> If this immense improvement has taken place in the London of 1895 as compared with that of 1800, what may be expected of the London of 1930 […]?[45]

Despite the conservatism of her predictions, this last passage reveals Ward to be motivated by the ideal of human progress; an ideal which she draws from the present's futuristic position relative to the past. Without being couched as sf, this piece evinces the same series of temporal interests – they are also, of course, the interests so fully embodied by the present-tense continuum of the periodical.

Different in agenda to Ward's article, but no less comprehensively engaged with the present, are those pieces (especially common in the Harmsworth press) which discuss some technological aspect of futurity. Alfred Arkas's 'A Twentieth Century Dinner: Foods of the Future' (*Harmsworth*

[42] [Ward], p. 572.
[43] Sawyer, p. 125.
[44] Peter Nicholls and David Langford, 'Prediction', *Science Fiction Encyclopedia*, 2011 <http://sf-encyclopedia.com/entry/prediction> [accessed 17 January 2012].
[45] [Ward], p. 575.

Monthly Pictorial, May 1899) might be presumed from its title to be a prediction of how eating will change over the coming decades. In fact, it is far more interested in what is already possible, focussing exclusively on food concentration methods which have already been developed. If it predicts anything, this article predicts only the normalisation into 'daily life' of currently existing technology: it is about the futurity of the present, not about the future itself. This is emphasised in its periodical context by its illustration: *Harmsworth*, like many of the illustrated monthlies, was prone to articles which used retooled photographs to convey statistical data. Concentrated foods are displayed beside their unconcentrated equivalents (to exactly one-quarter scale, Arkas is at pains to emphasise), but the most eye-catching images are the photographs stretched and distorted to represent the different quantities needed for sustenance by the average male (Fig. 2.3). These pictures break up the text in ways which would have been unfamiliar to readers of the previous decade, broadcasting the futurity of the magazine as much as the futurity of concentrated food. Both, of course, exist in the present tense: 'Nowadays, if you are not an epicure, you may carry a month's food in a Gladstone bag'.[46]

'The Horseless Future', by G. B. Burgin (*Idler*, May 1896) has an equally misleading title. Rather than an attempt to visualise a world without horse-drawn carriages, this piece is an interview with Henry J. Lawson, the engineer who credited himself with the invention of the motorbike and held the patent rights to the first motor-cars in London. As in Arkas's piece, the article is entirely about what is already possible – what has been achieved in France and America, how Lawson's inventions work, and how they compare financially to current modes of transportation. The important point here is that if Burgin looks forward at all, it is only to the universal adoption of a technology which is already at large, rather than any improvements in the technology itself, and these thoughts are always secondary to his reporting on Lawson's personality, and his assessment of the current situation. The title implies that Lawson is a representative of 'The Horseless Future', suggesting that it exists already and will widen to prominence, like the revolutionary New Journalist article format, the interview.[47]

[46] Alfred Arkas, 'A Twentieth Century Dinner: Foods of the Future', *Harmsworth Monthly Pictorial*, 2 (May 1899), 361–64 (p. 362).
[47] Chapter 3 contains a fuller discussion of the interview format in this context, but it is interesting to note in passing that the 'article type' category into which ProQuest's *British*

It is only in his last paragraph that Burgin gives way to any kind of outright consideration of the future:

> The horse is a noble animal and useful to man; but man, with his customary ingratitude, is trying to do without him – in cities at least. This is distinctly a move in the right direction […]. It is to be hoped that the horseless carriages will mitigate much animal suffering; there is not the slightest doubt that they will effect a social revolution in England in the next few years, and do away with a great deal of the nervous strain produced by our everyday, noisy traffic.[48]

Like Ward, Burgin puts his real future-reflections at the end of his piece, allowing the periodical to stretch forward. But, again like Ward, Burgin also looks to the past – the history of man's use of the horse – and the present – current standards of animal welfare in London. Human welfare too is under consideration, the emphasis being on the constancy of urban experience; the 'everyday'. Through Arkas, Ward, and Burgin's very different articles, then, an insistence on 'daily life', whose rhythm the periodical press has such a determining role in, can be discerned.

Another concern about the everyday world which Burgin shares with Ward is 'noisy traffic', which is also the preoccupation of another *Idler* piece, F. L. Oswald's 'Cities of the Future' (April 1896). Oswald argues that '[e]ven our indifference to smoke and dust will not astonish the citizens of the twentieth century as much as our tolerance of ear-splitting noises'.[49] Unlike the other pieces discussed in this section, Oswald's is a sincere attempt to imagine a technology-empowered future society; his future cities have air conditioning, skyscrapers, airships, fast railways and steamers, and more besides. Most interesting for our purposes, though, is the method by which Oswald arrives at his predictions. He opens:

> The main secret of weather prophecies is the plan to ascertain the drift of clouds and winds, and then calculate the probable result of their movements in a given time. It has often occurred to me that

Periodicals Online database has placed this piece is 'Fiction/Narrative'.
[48] G. B. Burgin, 'The Horseless Future', *The Idler*, 9 (May 1896), 577–81 (p. 581).
[49] F. L. Oswald, 'Cities of the Future', *The Idler*, 9 (April 1896), 421–26 (p. 424).

> the same method might be applied to all sorts of other predictions.[50]

Here, Oswald seems to draw on the concept of the science experiment, in which predictions are compared to data; the future notionally extrapolated from the past and present. A 'property that sets the genuine sciences apart', writes Peter Medawar, 'is their predictive capability'.[51] Medawar points out that Newton's laws are proved each time a tide-table is right. But extrapolating the future from past data is also, as we have seen, an inherent characteristic of the periodical, which is always using the present to look forward to its next issue – prediction, then, is not just a key feature of science, but also of the magazine. We can read the co-existence of social and scientific prediction in Oswald's work from the fact that his opening sentence contains both the word 'prophecies' and the phrase 'calculate the probable result of their movements in a given time'.

The non-fictional realm of weather forecasting is perhaps the place where science and the periodical are most obviously in concert to attempt a serious prediction of the future.[52] It is appropriate, therefore, that the subtitle of Ward's piece is 'A Forecast'; appropriate, too, that the weather is Oswald's starting point. Weather patterns recur throughout 'Cities of the Future', one of whose more minor predictions is improved meteorology: 'at the first alarm-signal of an approaching storm, [air-ships] will dodge for shelter like a flock of frightened birds'.[53] Many of Oswald's other predictions have a minor attachment to weather, from his opening discussion about keeping houses at an agreeable temperature to his idea that businesses will project advertisements onto the clouds. The cloud-advertising, though, is also suggestive of the links with periodical culture, which are not just implicit. News and especially advertising are the basis of several of Oswald's predictions, including the one which turned out to be his most accurate:

> [t]he time is near when metropolitan papers, full of good illustrations, entertaining stories, and news from all parts of the

[50] Oswald, p. 421.
[51] Peter Medawar, 'An Essay on Scians', in *The Limits of Science* (Oxford: Oxford University Press, 1985), p. 4.
[52] The first weather map appeared in the *Times* on April 1, 1875. It was prepared, incidentally, by Francis Galton, whose various involvement with the periodical press is documented in chapter 1, above.
[53] Oswald, p. 424.

> civilised world, will be distributed *free*, merely on the chance of attracting the reader's attention to the advertisement columns.[54]

Oswald's future is lousy with advertisements, news, and newspapers. It makes explicit the implied promise of Kipling's dateline, assuring us that the periodical press will flourish. Kipling, whose Night Mail airship rides out a severe storm over the Atlantic, also engages with the fluctuating, unpredictable present tense represented by weather. And the correspondences with Kipling don't end there, for whilst Kipling's is a work of fiction which makes several empowering formal and textual moves in the direction of non-fiction, Oswald's first-person essay occasionally finds it convenient to express itself with fictive devices. The best example of this occurs when Oswald provides the exposition for his cloud-advertising notion by reporting a conversation between two passengers on a transatlantic steamer, which begins as follows:

> 'What would you call that light over yonder?' a Spanish passenger will ask his Yankee travelling companion, as their steamer approaches the coast of the American continent, in the evening twilight of a November day. 'Can that be a thunderstorm at this time of the year?'
> 'That flickering on those low clouds? No, that's the light of an electric reflector,' says the Yankee. 'Our enterprising business men use that method to advertise their bargains in the neighbourhood of a large city.'
> 'What city can that be?'
> 'Savannah, I think,' says the American, after consulting his watch.[55]

Here, Oswald has decided that the best way for his audience to visualise his changes is for them to be introduced to it as the foreign tourist of the future, the 'infodumpee', the protagonist of sf. Crucially, as well, his speculations have given rise to characters and even a limited amount of plot in addition to a vision of the future; the cumbersome 'will ask' of the first speech gives way to the present tense 'says' of the second and fourth.

Many of the characteristics of these non-fictional pieces, from their tendencies towards narrative to their temporal conservatism in the midst of even their most extravagant hypotheses, are a part-consequence of their need to remain

[54] Oswald, p. 422. Original emphasis.
[55] Oswald, pp. 423–4.

materially attached to the present via the ongoing continuum of the periodical. This attachment is also demonstrated by the proximity of notionally scientific approaches to more fictive speculation, a proximity of which the weather forecast is an analogue. In all of these pieces, the periodical seems to have an effect on the content as well as the appearance of the author's predictions. For the supreme example of this, though, we must return to fiction – to one of the *fin de siècle*'s most famous pieces of sf.

IV. Periodicity and Narrative Truth in *The Time Machine*

W. E. Henley began his controversial editorship of the *New Review* in 1895 by serialising H. G. Wells's *The Time Machine*. The novel, which ran in instalments from January to May of that year, was the first in English to feature deliberate travel through time with a machine especially designed for the purpose.[56] Previous visions of the future had relied on dreams, unexplained cryostasis, or mystical teleportation in order to move people between time periods, typically somewhat to their surprise. *The Time Machine* brought a measure of temporal agency to the figure of the time traveller.

Wells's Time Traveller, who remains otherwise unnamed throughout the text, assembles a diverse weekly gathering of guests for dinner and enlightened discussion. It is to these guests, one of whom is the novel's narrator, that he declares his intention to travel into the future; it is to a slightly different gathering the next week that he relates his adventures. *The Time Machine*, then, preserves something of its serial structure on a narrative level – the dinners are regular occasions, part of the narrator's weekly calendar. But the resemblance of the tale to the vehicle is not just structural, for in those Thursday night gatherings it is also possible to discern an analogue for the miasmic inclusivity of the periodical. The audience to which the time traveller addresses himself includes a poet, a psychologist, a doctor, a rector, an editor, and a journalist – a mixed crowd whose members are also, when the Time Traveller isn't speaking, contributors to

[56] Peter Nicholls and David Langford, 'Time Machine', *Science Fiction Encyclopedia*, 2012 <http://sf-encyclopedia.com/entry/time_machine> [accessed 28 September 2012].

a mixed discussion. 'At first the conversation was mere fragmentary chatter, with some local *lacunae* of digestive silence', says the narrator, describing an archetypal occasion, 'but towards nine or half-past nine, if the God was favourable, some particular topic would triumph by a kind of natural selection, and would become the common interest'.[57] This harmonisation of polyphonous discourse is something that the narrator always looks forward to: 'the arrival of that moment of fusion, when our several conversations were suddenly merged into a general discussion, was a great relief to me' (p. 99). Providing the venue for this unification of diverse specialities into a continuous discourse, just as the space of a magazine does, the Time Traveller is described on the first page of the novel as a capable editor-figure, a 'vivid and variegated talker' whose 'fantastic, often paradoxical, conceptions came so close as to form one continuous discourse' (p. 98). He it is who both facilitates the mixed discourse of these periodical discussions and reconciles them, where necessary, into harmony.

Just as the Time Traveller's personality and weekly gatherings echo the agenda and form of the monthly magazine in which the novel appears, so too does his big idea, the idea of reconfiguring time as space. '[I]f you grasped the whole of the present, knew all its tendencies and laws, you would clearly see all the future', he argues, taking Oswald's non-fictional prediction strategy to its hypothetical extreme (p. 100). The explanation of his idea hinges on the imaginary figure of an omniscient observer, outside the flow of time, who would regard past and future as directions and who would need to conceptualise physical objects as having four dimensions rather than the generally-accepted three:

> An ordinary man, being asked to describe this box, would say, among other things, that it was in such a position, and that it measured ten inches in depth, say, three in breadth, and four in length. From the absolute point of view it would also be necessary to say that it began at such a moment, lasted so long, measured so much in time, and was moved here and there meanwhile.[58]

In order to be comprehensively understood, an object must have both its physical and temporal dimensions recorded. This idea, too, resonates with the material

[57] H. G. Wells, 'The Time Machine', *New Review*, 12 (January 1895), 98–112 (p. 98). Original emphasis.
[58] Wells, 'The Time Machine' (January 1895), p. 100.

existence of the periodical, which is always tracked in four dimensions – while bibliographers might be interested in the physical dimensions of an issue, most indexes are more interested in the title's duration, changes of publisher, and so on, exactly in keeping with Wells's stipulations. With the digitisation of periodicals, the more traditional first three dimensions are increasingly diminished in stature: *New Review*'s page on ProQuest's *British Periodicals*, for example, exclusively contains temporal information (Fig. 2.4).

It is the fourth-dimensionality of periodicals which defines them. Israel Zangwill's contemporary review of *The Time Machine* explicitly links the novel to the periodical time I've been discussing, 'a vast *continuum* holding all that has happened and all that will happen, an eternal Present', adding that '[t]here is really more difficulty in understanding the Present than the Past or the Future into which it is always slipping'.[59] Zangwill conceives a time machine to rival Wells's, based on the slow speed of light: 'we could travel to any given year by travelling actually through space to the point at which the rays of that year would first strike upon our consciousness'. This 'time machine' also recasts time as space, but unlike Wells's, does not permit the traveller 'the fallacy of mingling personally in the panorama' (p. 154). A user of Zangwill's machine can only ever be an observer, travelling forwards and backwards by moving physically closer to or further away from the object of study. Although no spaceship other than a library is needed to move between the volumes of present tenses, there is nevertheless an analogue here with approaching the study of an historical period via its periodical archive.

If *The Time Machine*'s discussion is empowered by the form and substance of Victorian periodicity, then its nightmare is a world in which that periodicity has ceased to exist. One of the defining features of Wells's 802,701AD is its lack of material culture, which includes not only a disturbing absence of newspapers and magazines but an absence of the structured time which they both reflect and reinforce – the Eloi's life patterns are governed by the moon, the waning and waxing of which increases and decreases the likelihood of a Morlock attack. Feeling isolated in the blank time of this uncomfortable future, the Time Traveller reassures himself by contemplating the

[59] I. Zangwill, 'Without Prejudice', *Pall Mall Magazine*, 7 (September 1895), 151–60 (p. 153). Original emphasis.

natural periodicity of the stars: 'I thought of their unfathomable distance, and the slow inevitable drift of their movements out of the unknown past into the unknown future'.[60] This passage looks similar to George Bell's 'A Journey Through Space', and both resonate with the periodical format as well as with astronomical reality. In the same passage, the time traveller also finds reassurance in the unimaginably slow (from a human perspective) revolution of the Earth's magnetic field: 'I thought of the great processional cycle that the pole of the earth describes. Only forty times had that silent revolution occurred during all the years that I had traversed'.[61]

Consolation, then, comes by salvaging some evidence of consistency over time. But when the Time Traveller voyages farther still into the future, even natural periodicity comes to an end:

> The alterations of day and night grew slower and slower, and so did the passage of the sun across the sky, until they seemed to stretch through centuries. At last a steady twilight brooded over the earth…[62]

This nightmarish far-future, in which the Earth's rotation has ceased and the sun has become stationary, is the end of periodicity – and implicitly, given entropy, the end of time itself, for how does one measure time if nothing changes? It is therefore unsurprising that when the Time Traveller returns to 1895 a few pages later, he instinctively looks to periodicity to reassure him that he is home:

> I saw *The Pall Mall Gazette* on the table by the door. I found the date was indeed today, and looking at the timepiece, saw the hour was almost eight o'clock.[63]

The clock and the copy of *The Pall Mall Gazette* are important not just for the specific information of time and date which they convey, but for the very fact of their existence: coming so soon after the never-setting sun of the impossibly distant far-future, they provide an elemental reassurance that the Time Traveller has returned to a structured, comprehensible age. Final evidence of how deeply

[60] H. G. Wells, 'The Time Machine', *New Review*, 12 (April 1895), 453–72 (p. 456).
[61] Wells, 'The Time Machine' (April 1895), p. 456.
[62] H. G. Wells, 'The Time Machine', *New Review*, 12 (May 1895), 577–88 (p. 579).
[63] Wells, 'The Time Machine' (May 1895), p. 584.

enmeshed 1895 society is in the rhythms of print culture can be seen in the narrator's description of his thoughts and activities as he waits – in vain, as it will turn out – for the Time Traveller to emerge from his laboratory. The Time Traveller is embarking on another voyage, and promises to return with evidence that his machine works:

> I heard the door of the laboratory slam, seated myself in a chair, and took up a daily paper. What was he going to do before lunch time? Then suddenly I was reminded by an advertisement that I had promised to meet Richardson, the publisher, at two. I looked at my watch, and saw that I could barely save that engagement.[64]

This passage is saturated with words – 'daily paper', 'lunch time', 'advertisement', 'publisher', 'two', 'watch', 'engagement' – which, especially in contrast with the unregulated time of the barren landscape from which the Time Traveller has recently returned, emphasise and re-emphasise the dependency of the present, of human civilisation versus bleak chaos, on regulated time.

It is important to note that the periodical nature of his world empowers the Time Traveller not only as a story-teller but also as a scientist. He has scientific qualifications (the specifics of which the narrator conceals), but is also marked out as a scientist by many of his activities in the narrative, from his responses to dangerous situations to the ways by which he tries to understand the future in which he finds himself. I've already drawn attention to the fact that Wells's was the first narrative in which the time machine was a deliberate invention, created from a hypothetically-reasoned theory about the world and verified by experiment.[65] In this respect, although its methods are rather less allegorical, *The Time Machine* arguably sits legitimately with any of the novels discussed by Caroline Levine in her critical work *The Serious Pleasures of Suspense*. Levine identifies suspense as the crucial characteristic of literary realism, arguing that rather than purporting to precisely depict the real world, as has since been assumed, realist fiction invited readers to get a sense of its otherness by distancing themselves from their assumptions – a method drawn, she says, from post-Enlightenment science. 'In order to grasp the fundamental

[64] Wells, 'The Time Machine' (May 1895), pp. 586–87.
[65] It is noteworthy that, in contrast with the period's many 'mad scientist' stories, the machine never malfunctions or fails its inventor in any way.

alterity of the world', Levine says, 'it was necessary to put aside one's own intellectual habits and presumptions. […] Realism came to mean the suspending of assumption and belief, and narrative suspense emerged as the realist strategy par excellence'.[66]

For Levine, the suspenseful pause is a place of earnest contemplation and reflection, in which the reader, like the protagonist of a novel – or a scientist – is introduced 'to the activity of hypothesizing and testing in order to come to knowledge' (p. 8). It is surprising, then, that she spends so little time considering the periodical, which has, as it were, the suspenseful pause built in.[67] It also seems odd, given the common ground between her proposal and Darko Suvin's cognitive estrangement, that sf doesn't get a mention. *The Time Machine* demonstrates that both would be worthy subjects for Levine. The Time Traveller's first experiment, conducted in front of a group which is not only a broad and educated periodical demographic, but also a mixed group of sceptical peers, involves only a small working model of the finished time machine, with the group proceeding to the full-size machine only after the model has been shown in action. 'And now I must be explicit', begins the narrator, prefacing a long description of the machine, 'for this that follows – unless his explanation is to be accepted – is an absolutely unaccountable thing'.[68] He understands that his account is not just a story but witness testimony to an experiment, and his thoroughness therefore satisfies the twin requirements of science (by its exhaustive descriptions) and suspense (through the delay in narrative action which those descriptions occasion).

It is not just the notion of experimentation which is built into Levine's theory, but a commensurate recognition of the need for speculation about the future: 'as we wait, suspended, to see whether or not the future will bear out our suppositions and desires, we experience a vital, vibrant *pleasure*'.[69] And like

[66] Caroline Levine, p. 3.
[67] Levine chastises earlier critics by suggesting that they 'have been inclined to forget what it is like to read Victorian novels *for the first time*' (p. 47, original emphasis), but makes very few concessions to the fact that most of the works she discusses first appeared in print either as serials or in magazines – in other words, that there frequently was a physical and temporal as well as a narrative vector to their suspenseful plots. This has potentially interesting repercussions for Levine's point that first-person past-tense narratives are intrinsically 'knowledgeable about a future that we [the readers] have not yet reached' (p. 133), especially in cases where authors compose endings to novels after their opening chapters have already appeared in print. For a similar argument, see Hughes and Lund, p. 8.
[68] Wells, 'The Time Machine' (January 1895), p. 102.
[69] Caroline Levine, p. 9. Original Emphasis.

science-fictional futures, realist experiments are about possibilities rather than prophecies: 'Art might not itself tell truths, but it has always already shaped our capacity to imagine what might be true' (p. 41). The real world, Levine suggests (via Ruskin), takes place not in art or life but in the speculative gap between them – the suspenseful gap caused by not knowing.

'[V]aluable knowledge', says Levine, 'is itself narrative in form'.[70] Truth is contingent on the passage of time: 'static visual clues necessarily fail to reveal the unsettled nature of emergent selfhood' (p. 148). This, like the Time Traveller's reflections, looks good alongside Bell's image of the solar system travelling towards a (specific, if currently obscure) point, apparently stationary in any given moment. But Levine's comment about the temporal vector of meaningful truth is also significant because it suggests that any discussion of suspense, narrative doubt, science, realism, and future-prediction – and, I would add, sf and the periodical – eventually comes round to being, finally, about truth. Specifically, it is about *ambiguous* truth. The story in which we are simply told everything, says Levine, leaves no space for us to suspend judgment; to think creatively about what we are reading. Perhaps because of this, *The Time Machine* is repeatedly at pains to cast doubt on some of its own facts, and in fact it is the Time Traveller himself who leads the way, closing the story of his adventures in the future by insisting that it is fabricated:

> Take it as a lie – or a prophecy. Say I dreamed it in the workshop. Consider I have been speculating upon the destinies of our race, until I have hatched this fiction. Treat my assertion of the truth as a mere stroke of art to enhance its interest.[71]

This is skilfully done, since, of course, this last is exactly what Wells has done. Yet the disavowal's position in the narrative, the level of detail in the story we've just heard, and the narrator's own reassurances – 'you cannot see the speaker's white, sincere face in the bright circle of the little lamp, not hear the intonation of his voice' – coupled with the fact that it's the Time Traveller himself who asks us to disbelieve, serve to make the passage have exactly the reverse effect upon us.[72] The narrator is never provided with any conclusive first-hand evidence that

[70] Caroline Levine, p. 148. I have deemphasised this quotation.
[71] Wells, 'The Time Machine' (May 1895), p. 584.
[72] Wells, 'The Time Machine' (January 1895), p. 109.

the machine works – a few broken and odd-looking flowers and the Time Traveller's curious disappearance (he leaves in search of more concrete proofs, and never returns). In real life, the thing would seem wildly unlikely; from an interior perspective, though, no seasoned reader can be in doubt. The very fact of the narrative's ambiguity is proof positive of its internal authenticity.

Wells always keeps the Time Traveller's story at arm's length by leaving the character unnamed and bringing all his testimony to us via the intermediary figure of the (also unnamed) narrator. In fact, *The Time Machine* is the archetypal 'club story', and one of the novels named by John Clute in his definition of the term. Clute describes a club story as 'a witness against any stable understanding of a darkening world', and indeed the provenance of Wells's novel seems to waver constantly.[73] On the one hand, there is the narrative dominance of the Time Traveller and his tale; on the other, the paucity of his evidence and the creeping elements of doubt interposed both by him and by some of his audience.

Kipling's and Wells's stories have this much in common: both are empowered by the act of muddying the truth-status of their narratives. 'With the Night Mail' is fiction which reads like an article and appears in a magazine alongside non-fiction pieces it is crafted to resemble. Kipling's ambiguity is drawn from its structural relationship with the periodical; likewise, Wells's novel embraces periodicity to create uncertainty about its truth-status – after all, the *New Review* for the most part printed political opinion pieces, diplomatic and historical articles, and travel writing, and throughout *The Time Machine*'s run there was never more than one other fictional piece per issue.

It goes without saying that nobody is expected to actually find either *The Time Machine* or 'With the Night Mail' literally convincing. Both are obviously fantastical but, since they are so obviously so, it is worth asking why their authors go to such lengths to render their apparent truth-status so ambiguous. In the closing section of this chapter, I want to argue that the club story, future prophecy, sf and science itself can be united by their emphasis on the importance of vagueness, and that vagueness, an essential quality of the periodical's

[73] John Clute, 'Club Story', *Science Fiction Encyclopedia*, 2012 <http://sf-encyclopedia.com/entry/club_story> [accessed 26 January 2012].

relationship with time, is one of the most important characteristics we can retrieve from them today.

v. The Importance of the Vagueness of the Present

Mikhail Bakhtin understood a fundamental interrelationship of both science and the novel, locating the origins of both in the Socratic dialogues. 'When the novel becomes the dominant genre', he writes, 'epistemology became the dominant discipline'.[74] Bakhtin uses the term 'novel' very differently from me, seeing it as an always-emergent artistic force defined by its newness rather than by its book format – the novel is a genre, alongside, say, the epic. This definition of the novel would also incorporate much of the shorter fiction which appeared, originally, in periodicals – indeed, I believe that the periodical (format) has much in common with Bakhtin's novel (genre),[75] the main feature of which he describes as 'an indeterminacy, a certain semantic openendedness, a living contact with unfinished, still-evolving contemporary reality (the openended present)'.[76] For Bakhtin, what makes the novel unique is its continued willingness to associate with the present day – this characteristic is intrinsically connected to the way it fosters ambiguity and admits of multiple voices and perspectives:

> The present, in its so-called 'wholeness' (although it is, of course, never whole) is in essence and in principle inconclusive; by its very nature it demands continuation, it moves into the future, and the more actively and consciously it moves into the future the more tangible and indispensable its inconclusiveness becomes.[77]

'[I]f you grasped the whole of the present', theorised Wells's Time Traveller, 'you would clearly see all the future': seen mathematically, the present always already leads to the vagaries of the future, and (hypothetical) comprehension of it

[74] Bakhtin, p. 15.
[75] I am not the first to suggest this link - see, for instance, Laurel Brake and Julie F. Codell, 'Encountering the Press', in *Encounters in the Victorian Press* (Basingstoke: Palgrave Macmillan, 2005), pp. 1–7 (p. 5).
[76] Bakhtin, p. 7.
[77] Bakhtin, p. 30.

inevitably leads to future-prediction.[78] Both Wells and Bakhtin, in their different ways, emphasise the importance of indeterminacy in this process. Wells does it with narrative ambiguity, occasioned both within the text and by virtue of its periodical connections. Bakhtin is politically explicit: the novel's constant engagement with newness necessarily brings with it a rejection of canonicity and authoritarian discourse – heteroglossia.

Like Caroline Levine, Bakhtin sees the science experiment as an important model for the novel's work in subjecting an assumed reality to interrogation:

> As it draws an object to itself and makes it familiar, laughter delivers the object into the fearless hands of investigative experiment – both scientific and artistic – and into the hands of free experimental fantasy.[79]

Science and the novel are drawn together by their resistance to an eternally-fixed, authority-driven explanation of the world. This resistance, for both Levine and Bakhtin, is a function of the way that both engage with time – their insistence on living in the present tense. I want to add to the periodical to their analyses. Its format complements these structural concerns by the inherent involvement in the present which I have shown in my readings of the fictional and non-fictional material collected in this chapter. By its ideal, James Mussell writes, the periodical invites a present-tense understanding which we often neglect:

> Although from our perspective newspapers and periodicals appear as finished works, neatly lined up on the shelf, what they model is a process predicated upon not finishing, where the latest issue is not the last.[80]

Magazines are also, of course, heteroglossic to an extent that volumes seldom manage; not only authored, edited, and published by a wide range of actants, but also amalgamating vastly different types of content, and varying over time as well as with duration.

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[78] Wells, 'The Time Machine' (January 1895), p. 100.
[79] Bakhtin, p. 23.
[80] Mussell, *The Nineteenth-Century Press in the Digital Age*, p. 31.

Science, the demotic genre of the novel, and the magazine. These are the things which gave rise to what Hugo Gernsback would eventually kraal under the label 'science fiction', and it is therefore no surprise to find that the genre's predictions of the future are equally dependent on ambiguity – formal, material, or textual – for their artistic effects.[81] Wells's distrust of utopian fiction, which I mentioned at the beginning of this chapter, can be traced back to this. He dismisses it as a kind of writing 'necessarily concrete and definite; it permits of no open alternatives; its aim of illusion prevents a proper amplitude of demonstration'.[82] Perhaps, too, this explains why Ward's vision of 1930 seems distasteful, for it is a fantasy of aesthetic coherence ('What a splendid achievement it will be to harmonize the strident discords that disfigure the simple melody of life!'[83]). It might explain why Arkas's twentieth century dinners never came to pass – the monotony of a pill diet, like the uniformly-painted houses of Ward's London, being necessarily at odds with the many-voiced, self-contradicting, impossible-to-define hubbub which constituted (and constitutes) the popular press, the progress of science, and the genre of sf. Finally, it might explain Kipling's distant treatment of the regime which runs the world in 'With the Night Mail', the Aerial Board of Control, whose rule over the planet is described only in passing and requires a second, sequel story in order to be explored properly.[84]

All of the above constitutes an elucidation of the initially surprising fact with which I began, the fact that *fin de siècle* sf seems more interested in portraying an ambiguous, factually uncertain present than in prophesising the future. But in the preface in which he raises this question, Sam Moskowitz treats the temporal specificity of these stories not as a curiosity of genre but as a marker of period authenticity:

> …the events you will read about here include the destruction of the great cities of London and New York; the thrilling tale of a

[81] See also Beer, *Darwin's Plots*, p. 18.
[82] Wells, 'Anticipations', p. 747. Wells here condemns all fiction-as-prophecy - indeed, the footnote from which this quotation is taken could be read as a firm disavowal of sf's obligation to predict the future. Wells claims here that all fiction was necessarily definite and concrete - I hope that my reading of *The Time Machine* in section four, above, substantiates my disagreement with him on this point.
[83] [Ward], p. 574.
[84] This was 'As Easy as A.B.C.', a very different piece of writing to which 'With the Night Mail' is often unfairly treated as an introduction. See note Error: Reference source not found, above.

> tube under the ocean; the implementation of weather control; systems for walking through walls; the discovery of fantastic monsters on land, sea, and in the air […]. All have *taken place* in a familiar yet bewildering 'world of if' that once we knew, but not like this![85]

As the title *Science Fiction by Gaslight* implies, Moskowitz emphasises the vintage of his chosen stories as much as their novelty. In other words, the present-ness of these stories has become, for us, a past-ness – one with commercial value, for the continuing appeal of many of these texts lies in the retro feel of their kitsch aesthetic. Testament to our fascination with these past-futures is the success of steampunk, the sf subgenre which is as much an aesthetic movement as a literary one, and which has arisen in the years since the mid-1980s.[86] For the twenty-first century reader (or researcher), these stories are compelling because their imaginative worlds are simultaneously both quaint and futuristic: 'it is as if we suffer from a nostalgia for the future of the past'.[87] My closing point in this chapter, therefore, concerns the power not only of the present's ambiguous glance into the future, but of its retrospective glance at the past.

Bruno Latour draws time's arrow on two axes, adding a scale of comprehension and reinterpretation to the straightforward temporality of the one-dimensional model.[88] 1895 is a very different idea in 1868 and 1900, and in 2012 it is different again. Reading sf – reading the period's magazines in general – is a way of trying to get at some of the other 1895s which have fallen by the wayside, the more literal 'other presents'. In his essay on 'With the Night Mail', Andy Sawyer puts it another way:

> We can, if necessary, read science fiction as alternate history. But even more, we can read it as emblems of futures long passed and superseded, stories of pasts that might have been futures, creative designs made to test their plausibility and capacity for illusion.[89]

[85] Moskowitz, p. 13 Original emphasis.
[86] For one account of the history of Steampunk, including (chap. 2) its relationship with Verne and Wells, see Jeff VanderMeer and S. J. Chambers, *The Steampunk Bible: An Illustrated Guide to the World of Imaginary Airships, Corsets and Goggles, Mad Scientists, and Strange Literature* (New York, NY: Abrams, 2011). For an impression of Steampunk's aesthetic impact beyond literature, see 'Dr. Grymm', *1000 Steampunk Creations* (Beverly, MA: Quarry Books, 2011).
[87] Sawyer, p. 125.
[88] Latour, *Pandora's Hope*, pp. 172–73.
[89] Sawyer, p. 127.

This kind of historicism is almost an analogue of future-prediction, for it engages in the same doomed struggle against the ineluctability of time's arrow, the unchangeable rate at which present becomes past. The periodical is part of the wider technologically-powered project, which also incorporates clocks, calendars, meridians, and time zones, by which humans have attempted to order time's arrow into something comprehensible, something which can be controlled. Future-prediction and historicism are both, in their ways, the yearning which remains after the fact; like the Time Traveller, they fantasise about escaping the gradual accumulation of the ages.

In the February 1898 *Idler*, Mary Geoghegan wrote a retrospective of 'A Lady's Magazine of the Beginning of the Century', for which she read an 1813 volume of *The Lady's Magazine; or Entertaining Companion for the Fair Sex*. 'Only a little over eighty years ago, and yet how antiquated the spirit in which most of the articles are written', she notes.[90] But though much has changed since 1813, it is ultimately the similarities which Geoghegan chooses to dwell on, concluding despite the antiquated language that 'human nature is human nature in all ages' (p. 148). In the years since her own article appeared, Geoghegan's language has, in its turn, aged. Much else has happened besides, but though society has changed dramatically, it has not done so out of all recognition. On January 11th, 2012, the BBC news website ran a story about John Elfreth Watkins, an American civil engineer who, in 1900, 'made a number of predictions about what the world would be like in 2000'.[91] Reviewing Watkins's ideas against the backdrop of New Year's future predictions in the media (which have developed a periodical regularity of their own), the article, like many before it, cherry-picks those predictions which Watkins got 'right' (ie. which can be read as resembling events as they actually unfolded). Watkins's 'mistakes' are relegated to the bottom of the page. This piece is most obviously a reminder that neither prediction nor journalism are sciences, but it also conveys a wistfulness for continuity with the past, just as Geoghegan's piece in the *Idler* does. 'Ten 100-year Predictions that Came True' is meaningless as a commentary on

[90] Mary Geoghegan, 'A Lady's Magazine at the Beginning of the Century', *The Idler*, 13 (February 1898), 142–48 (p. 147).
[91] Tom Geoghegan, 'Ten 100-year Predictions That Came True', *BBC News*, 2012 <http://www.bbc.co.uk/news/magazine-16444966> [accessed 11 January 2012].

science or society, or even on Watkins, but it does satisfy the urge to reduce our distance from the past with which we continue to define ourselves. Just as meaningless, and just as satisfying, is the name of the article's author – Tom Geoghegan, presumably no relation.

People have always, in the past, predicted the future in the present. The present tense, as well as being incomplete and inclusive, is also wistful. No matter how definite and unyielding the past and future may seem, the present never goes away. And when one reads a periodical 115 years later, the tense hasn't changed – whatever else has. Bakhtin says of the novel form that '[o]nly that which is itself developing can comprehend development as a process'.[92] This is also a truism for scientists, who must always be at the cutting edge of research in order to uncover new things about the world. The periodical, like Bell's solar system and like time itself, is always currently engaged in the act of going somewhere. And perhaps the best reason of all to resist a strict definition of sf is that it, too, has always thrived on its present-tenseness. In order to comprehend the changing, ambiguous, indefinable, and uncertain world, it has to embrace all of those characteristics itself.

And the literary critic? English studies, too, thrives on its own ambiguous approach to tense. 'Wells said that…', 'Wells says that…': these are phrases which – not, I hope, to the discomfort of the reader, for the practice is common – I have used more-or-less interchangeably in this thesis. Grammatical tics such as these, as well as our pedagogical insistence on subjectivity, on the multiplicity of meanings and texts and publics (there are so few 'wrong answers' in our discipline) are evidence that literary critics understand the value of vagueness, its crucial role in resisting the authoritarian voice. This is a temporal concern as well as a spatial one, often pursued by highlighting the differences between a given chronological moment and ours. I suggest, though, that as with the strategy for literature and science laid out in my introduction, highlighting the similarities might be even more productive: not only a more peaceful strategy, but one which could open up, as Caroline Levine might put it, exciting new spaces for experimentation and contemplation. In order to make a gesture in this direction, I hand the end of this chapter to Mary Geoghegan, writing (or 'who wrote') in

[92] Bakhtin, p. 7.

1898 words that, thanks in part to their material location, continue to offer a pause in which to do some meaningful, present-tense thinking:

> But here the chastening reflection intervenes, what will our descendants think of the towering headgear, the too expansive sleeves, of to-day?
>
> And our clumsy domestic appliances; and inadequate modes of transit; the – to them – inexplicable limitations of science; unredressed political wrongs; ineffectual methods of dealing with glaring social evils; savage sports; brutal crimes; archaic punishments; the hundred and one faults and follies and cruelties – invisible to our eyes, looming large to the astonished gaze of posterity, as portrayed in that history of our own times – the daily press?[93]

*

My first two chapters have sought to demonstrate the inherent connections between the periodical format and the relationship between science and fiction, as well as complicating the idea that the latter two can casually be treated as opposites. In chapter 3, it is time to increase the scope once again and take these arguments explicitly into the arena of the New Journalist magazines, whose curious relationship with truth and authenticity inflects many of the correspondences between science and fiction, and which show that close and effective exchanges between the two were not always to mutual advantage.

[93] Mary Geoghegan, p. 148.

Chapter Three: New Photography

I. A Sense of Possibilities

> We are on the eve of the Fourth Dimension; that is what it is! But what is the Fourth Dimension, and what are we on the eve of? That will naturally be the question of the reader who is not familiar with the speculations of the scientific imagination.[1]

With these majestic sentences, W. T. Stead launches one of his many disquisitions on the occult in the *Review of Reviews*.[2] The piece, which bears a heavy (and unacknowledged) debt to Edwin A. Abbott's novella *Flatland* (1884), invites the reader to consider a one-dimensional space, populated by self-aware atoms who can move only forwards and backwards. Add the concept of breadth to such a length-only universe, Stead says, and imagine the outpouring of scepticism and recrimination amongst its population for those who first experienced it. Introduce height, and 'no recollection of first dimensional space, from which they had gradually risen, would deter them from denouncing as crazy visionaries those who ventured to talk nonsense about above and below'.[3] Just

[1] [Stead], 'Throughth; or, on the Eve of the Fourth Dimension', *Review of Reviews*, 7 (April 1893), 426–32 (p. 426).
[2] For a summary of Stead on the occult, in the *Review* and elsewhere, see Roger Luckhurst, 'W. T. Stead's Occult Economies', in *Culture and Science in the Nineteenth-Century Media*, ed. by Lousie Henson and others (Aldershot: Ashgate, 2004), pp. 125–35 (p. 127).
[3] [Stead], 'Throughth', p. 427.

so, argues Stead, are we three-dimensional beings on the eve of having our eyes opened to the fourth.

Indications of the existence of the Fourth Dimension, which Stead charmingly names 'Throughth' ('…if I may venture to give it a name…') apparently include clairvoyance, telepathy, crystal vision, psychometry, and automatic writing, and Stead devotes the bulk of this article to discussing the latter (p. 426). However, it's his general opening remarks which make such a fitting opening for this chapter. The words quoted above encapsulate an attitude towards progress which Stead surely shared with many of his contemporaries: the defiant and excited proclamation of the first sentence; the immediacy and awkwardness of the second; the insistence on a link between science and the imagination in the third. Above all, the word 'eve' is significant: the suggestion is that we are on the verge of achieving some great new understanding about the universe, only previously hinted at.[4]

With the occult phenomena he yearned for thoroughly discredited by modern (and, in many cases, contemporary) science, it's easy to forget that Stead's optimism in this regard was actually entirely justified. Less than three years after the publication of 'Throughth', news reached England that a new kind of light had been discovered beyond the perceptive ability of the human eye, a light which passed through apparently solid objects as if they weren't there, a light which could be used to photograph living bones: the X-rays.

Wilhelm Röntgen's discovery, made at Würzburg in November 1895, first appeared in English in the pages of *Nature* on January 23rd, 1896. The medical applications of the discovery were recognised instantly, and the speed with which they were taken up by the periodical press was equally remarkable - the first piece of fiction about X-rays which I have been able to find appeared in *Pearson's Magazine* less than three months after *Nature*'s publication of the discovery (I discuss this work in section three, below). The speed of its appearance, and that of other fictions which directly or indirectly dealt with X-rays, can partly be explained by the fact that although Röntgen had described a method of reproducing this strange new radiation in controlled conditions, the scientific community had yet to offer a convincing explanation for it. 'No crucial experiment has yet been made' uncovering the nature of the X-rays, Alfred

[4] I return to this important notion at greater length in the final section of chapter 4, below.

Porter declared at the end of an eleven-page article in the *Strand* – one which, science being thus unavailable, devotes the bulk of its length to the photographic spectacle of the X-rays instead.[5] When H. J. W. Dam travelled to Würzburg to interview Röntgen for *Pearson's Magazine*, the following exchange took place:

> 'Is it light?'
> 'No.'
> 'Is it electricity?'
> 'Not in any known form.'
> 'What is it?'
> 'I don't know.'[6]

Working prior to the discovery of the electron, Röntgen's own theory was that the X-rays represented longitudinal waves in the luminiferous ether, an all-permeating medium in which the whole of creation was suspended, posited to explain the behaviour of light. The ether was an established theory, but one which was losing ground in the 1890s, having failed to appear in any experimental results (Einstein's special relativity finally put paid to it in 1905). Röntgen is cautious about the ether theory even in his original paper in *Nature*, which ends with the guarded disclaimer:

> I must confess that I have in the course of this research made myself more and more familiar with this thought, and venture to put the opinion forward, while I am quite conscious that the hypothesis advanced still requires a more solid foundation.[7]

This paragraph, which follows the only piece of supposition in an otherwise straightforward account of the facts, emphasises a key characteristic of X-rays in the early days following their discovery: to the public, at least, they were as well explained by the spiritualists as by the scientists.

In fact, the two world-views seldom constituted such a straightforward binary. William Crookes, noted physicist, discoverer of Thallium and inventor of a part of the apparatus with which Röntgen made his discovery, the Crookes Tube, was an avowed spiritualist and later became president of the Society for Psychical Research (SPR). To those who had been discussing spirit photography,

[5] Alfred W. Porter, 'The New Photography', *Strand Magazine*, 12 (July 1896), 107–17 (p. 116).
[6] H. J. W. Dam, 'A Wizard of To-Day', *Pearson's Magazine*, 1 (April 1896), 413–19 (p. 419).
[7] W. C. Röntgen, 'On a New Kind of Rays', *Nature*, 53 (23 January 1896), 274–76 (p. 276).

invisible light, and worlds beyond human perception for years, the discovery would have seemed a valorisation rather than a surprise. '[T]he [SPR's] belief that the photographic plate could detect ghostly rays invisible to the human eye appeared prophetic in light of Röntgen's discovery', notes Allen W. Grove.[8] This suggests the way in which I propose to understand X-rays here: as part of a spectrum of equally unbelievable and even laughable ideas, *some of which were true*. They can be interrogated in the light of Roger Luckhurst's comment (on the historiography of the Victorian supernatural more generally) that science and the occult:

> …are now conceived less in monolithic oppositional structures than as complexly interwoven *networks*, looping together social, institutional, epistemological, and representational resources in ways which problematize secure disciplinary demarcations.[9]

If science and the occult are 'complexly interwoven networks', then examining a phenomenon which promised to contain elements of both might usefully illuminate some other 'loopings together'. Psychic communication with the dead; photographs to which living flesh is transparent as air: both have their place in Stead's Fourth Dimension, and in the press over which he had such a profound influence.

This chapter uses the example of X-rays to scrutinise the way that the New Journalism approached the issue of objective truth. The central point, that the magazines' insistence on diversity of both textual and visual content inherently de-emphasised objective truth and is part-responsible for science's less-than-dominant position in their pages, is made via examinations of several types of writing: advertising, humorous opinion pages, and avowedly non-fictional writing on the occult in section two; the interview or 'chat' (a decidedly New Journalist invention) in sections three and four; and fiction in section five. The sixth section pieces together the conflicted attitudes towards X-ray technology documented in the preceding five, arguing that the array of conflicting voices which constituted the New Journalist approach to truth also

[8] Allen W. Grove, 'Röntgen's Ghosts: Photography, X-Rays, and the Victorian Imagination', *Literature and Medicine*, 16 (1997), 141–73 (p. 142).
[9] Luckhurst, 'W. T. Stead's Occult Economies', p. 125. Original emphasis.

explains its variable relationship with science with is still evident in the present-day mass media.

Before going any further, it is important to mention that although the X-rays are a highly convenient example for this argument, I don't wish to claim any kind of special status for them. This was a rich time for Physics, and one might as easily examine the discoveries of, say, Marconi, Rutherford, or Einstein for insight into the dissemination of science into fiction.[10] As a case study for understanding science's place within the polyphonous voice of New Journalism, however, X-rays are attractive. This is partly because of their prominence in some of the clichés of later sf ('X-ray goggles' and scores of similarly unlikely twentieth-century creations), but mostly because as well as being a new discovery they are also a distinctly visual one, with an immediate and obvious impact on print culture's aesthetic. Seen from the perspective of periodical studies, therefore, X-rays highlight not only the relationships between science and fiction but the relationships between the periodical press and authenticity; between journalism and real life. X-rays were decorative and artistic as well as ghoulish and unsettling, and they were also scientific portrayals of a previously inaccessible inner truth. A reading of their first appearance therefore naturally brings a whole range of areas – journalism, literature, print history, images, advertising, science, technology, celebrity, the supernatural – into contact with each other. Their 'discovery proves an important moment in literature', says Grove, 'as it blurs the boundaries between ghost fiction, science fiction and scientific reality'.[11]

To emphasise this series of interrelations, most (although not quite all) of the primary material in this chapter is taken from just two years, 1896 and 1897. Within this tighter chronological spread, my emphasis here is on the breadth of *types* of writing and image published by the magazines. This variety is my principle evidence for the argument that New Journalism sought its truth-authority in a range of places, science being just one of these, and that the inevitable contradictions which emerged as a result were thus an intrinsic part,

[10] For an essay which discusses Einstein in popular fiction, for example, which also discusses the 'fourth dimension', see Katy Price, 'On the Back of the Light Waves: Novel Possibilities in the "Fourth Dimension"', in *Literature and Science,* ed. by Sharon Ruston (Cambridge: D. S. Brewer, 2008), pp. 91–110.
[11] Grove, p. 142.

rather than an unfortunate by-product, of *fin de siècle* mass media. The advertising section, satirical columns and fiction as well as interviews were all affected evenly by the material conditions of their production and consumption as part of the same polyphonous vehicle of transmission. Placing these different pieces of writing back alongside each other, as I have here, does more than simply draw attention to this fact – although that is valuable in itself. It also sheds light onto the nature of the conflicted relationships between science, fiction and the media which, I suggest, endure still.

II. Visible Invisibility: Sales, Satire, and Spiritualism

In this section, I discuss examples of three very different non-fictional treatments of X-rays: their commercial appropriation in the advertising supplements, the humorous use made of them by satirical columnists Barry Pain and W. L. Alden, and the reaction of the spiritualists, whose interest in X-rays I have already mentioned above. These pieces of writing use X-rays very differently. What they have in common, I suggest, is an interest in focussing on practical or aesthetic ends rather than on technical means. Despite the scientific nature of their subject matter, they are all discussions in which science itself is rendered invisible, an implied process rather than an explicitly-discussed breakthrough in human understanding.

X-rays reached the advertising section less than six months after the appearance of Röntgen's *Nature* article. A lavish image advertising the oral hygiene product 'Sozodont' appeared in the *Strand* (among other places), depicting a fresh-faced young lady sitting in the consulting chair of a dentist's surgery. Illuminating her is a beam of X-rays, which also lights up the dentist himself, reading some notes on the right hand side of the picture. 'Dr. Van Buskirk applies the Röntgen Rays in his Dental Practice', says the caption, 'and finds that those habitually using SOZODONT have perfect Teeth, hard Gums, and sweet Breath' (Fig. 3.1).[12] The advert suggests several important things about the ways in which X-rays were understood, not just in the inaccuracies of its text (X-rays may be useful for examining teeth, but are far less so for breath) but also

[12] 'Sozodont Advertisement', *Strand Magazine,* xii (July 1896), p. ix.

in the way the image itself is composed. The equipment behind the woman's chair is the room's only light source, which seems at odds with one of the most well-known facts about the new rays – that they were invisible to human eyes. The intense beam which lights up doctor and patient casts into shadow the rest of the equipment in the room, as well as two pictures which hang on the wall of the surgery: X-rays of a hand and foot respectively.

Images of a hand and a foot seem strange things to display in a dental surgery, but crowing over the advertisement's scientific absurdities is less important here than realising that the rays are being used primarily for their aesthetic. The visible beam is not literally Röntgen's discovery but the figurative light of the truth which that discovery enables the doctor to see: instead of two skeletons, it reveals a sensible medic and a robust, smiling patient, healthy because of her choice of dental products. Kate Flint uses this advertisement (which she encounters in the *Illustrated London News*) to highlight the extent to which photography 'promised an enhanced role for ocular proof' in late-Victorian Britain.[13] In her exploration of the limitations of human sight, Flint evokes Walter Benjamin's notion that photography discloses the 'optical unconscious'. 'It is indeed a different nature that speaks to the camera from the one which addresses the eye', Benjamin tells us, 'different above all in the sense that instead of a space worked through by a human consciousness there appears one which is affected unconsciously'.[14] The Sozodont advertisement is an illustration rather than a photograph, but the vehicle of its metaphor is the proof-authenticity of photography (in this case, X-ray photography), and via its consciously-composed aesthetic focus on end results, it shifts scientific process into implication. Despite apparently being made visible, the X-rays themselves are harder to see here than ever – though their iconography abounds in this image, they, with their incomprehensible extra-sensory properties, their unnerving display of a patient's living bones, and, of course, their long exposure and development times, are absent. What remains to encourage potential consumers of Sozodont is their newness and their effectiveness. Flint summarizes the 'optical unconscious' by speaking of photography's ability 'to

[13] Kate Flint, *The Victorians and the Visual Imagination* (Cambridge: Cambridge University Press, 2000), p. 30.
[14] Walter Benjamin, 'A Short History of Photography', *Screen*, trans. by Stanley Mitchell, 13 (1972), 5–26 (p. 7).

make us realise what we see without realising that we have seen it': here, though, we see the reverse of that proposition.[15] An actual photograph may bring truth out of the unconscious, but the concept of photography can still be used to displace it. In this advert, and many others since, we realise what we see without realising *how* we have seen it.

This sets up an intriguing parallel between X-rays and the periodical press itself. If the X-rays are at the same time ostentatiously on show in the advert and entirely missing from it, they share this characteristic with advertising *per se*, which accounted for many of the most arresting images printed in the illustrated monthlies, and which, as Warren Chappell and Robert Bringhurst note, 'formed the primary market for new type designs', yet which many readers would presumably have skipped past, confined as they typically were to a long supplement at the beginning of each issue and a shorter section at the back.[16] Many research libraries have removed these sections, and almost no advertisements are scanned when monthlies are digitised, so for the present-day researcher the advertising sections remain an equally present absence: literally invisibled by our conservation decisions, yet the main economic driving force behind the developments in print technology without which these publications could not have existed.

Indeed, physical print technology itself constitutes a present absence, for it had only recently developed to the point where indulgences such as this three-quarter-page image could appear in the pages of a magazine like the *Strand* affordably. In response to the demands of the newspaper and advertising industries, the steam-presses which allowed the mass production of magazines were being constantly improved. Image printing through wood engraving was growing ever more sophisticated, and the half-tone process (which at least one print historian has dated to 1896, the year X-rays made their debut[17]) was shortly to revolutionise the reproduction of photographs of all kinds.[18] Two layers of image, then, attest to the quality of Sozodont: the X-ray pictures on the dentist's

[15] Flint, *Victorians and the Visual Imagination*, p. 30.
[16] Warren Chappell and Robert Bringhurst, *A Short History of the Printed Word*, 2nd edn (Point Roberts, WA: Hartley & Marks, 1999), p. 195.
[17] P. M. Handover, *Printing in London* (London: George Allen & Unwin, 1960), p. 169.
[18] The Daily Mirror, in 1904, became the first London publication to print photographs exclusively. For more details on the changes in commercial printing during this period, see for e.g. Michael Twyman, *Printing 1770-1970: An Illustrated History of Its Development and Uses in England* (London: The British Library, 1998), p. 104.

walls (in the picture) and the large, detailed, aesthetically appealing engraving (in the magazine). In both cases, the technology which makes the imaging possible and attractively new is fetishized by the elision of its mechanics of production. With X-rays, it is literally impossible to see the process, which takes place on wavelengths the human eye cannot detect; the process of printing, meanwhile, is geographically removed from the leisured reader, taking place, in the case of the *Strand*, not in the public art gallery of the Newnes offices on Southampton Street, which displayed some of the magazine's most notable illustrations on its walls (and offered prints for sale), but in the private, state-of-the-art industrial printing facility elsewhere in the building.[19] Only final products are visible to the reader.

This chapter will return to the relationships between X-rays and printed images in due course. For now, the main idea I want to use is the 'black box', the circumscription of a mechanical or digital technology into an integrated device the operations of which need not be seen or comprehended by the end user.[20] Epitomised in today's smart phones (for instance), and surely one of our own most basic technological fantasies, it's clear from this glance at periodical advertising that the black box also captured imaginations in the *fin de siècle*. On the page facing the Sozodont advert, a much smaller image advertises the benefits of new patent sound discs for the hard of hearing. These remarkable new devices are, apparently, 'the same to the ears as glasses to the eyes. Invisible' (Fig. 3.2).[21] It is, perhaps, a corollary of Arthur C. Clarke's third law of prediction – 'any sufficiently advanced technology is indistinguishable from magic' – that invisibility is a desirable characteristic in any technology which wishes to seem futuristic.[22] The Sozodont advert, then, is not so much an engagement with recent scientific advances as a fantasy of a near-future when such advances can be taken for granted. It enacts this fantasy by taking advances for granted itself, be they the ability to photograph living bones or the ability to reproduce those photographs on a mass scale with new printing techniques.

[19] Geraldine Beare, *Index to the Strand Magazine, 1891-1950* (Westport, CT: Greenwood Press, 1982), p. xiv.
[20] For a definition of the 'black box', see Latour, *Pandora's Hope*, p. 304.
[21] 'The New Patent Sound Discs Advertisement', *Strand Magazine*, 12 (July 1896), viii (p. viii).
[22] Arthur C. Clarke, *Profiles of the Future: An Inquiry into the Limits of the Possible* (London: Victor Gollancz, 1982), p. 36.

In this respect, the advertisers had common ground with some of the satirical columnists, who were also more interested in what the X-rays implied about the future than in what they revealed about the present. An excellent example of this is the sixth in Barry Pain's 'Nature's Next Moves' series in *Pearson's Magazine*. Supposedly assembled from the notes of a scientific free-thinker named Archibald Mosely Damstruther, these jocular pieces offered anticipations of forthcoming changes in the world of science, particularly biology. The running joke was that Nature, rather than human agency, was responsible for new developments. The 'Treble-X Rays', claims Damstruther in this instalment, 'seem to me to be due about now'. They are similar to the X-rays already known, but offer a rather different sort of insight: 'The operator presses the bulb and for the hundredth part of a second the Treble-X Rays pass through the head of the subject, and throw the record of his thoughts on the screen'.[23] Whilst the Röntgen rays are for reading the body, the Treble-X Rays are for reading the mind. Pain was not alone in satirically raising the prospect of photographing thoughts. W. L. Alden, writing his 'Wisdom Let Loose' column (also in *Pearson's*), worries about the consequences of what he calls 'brain photography':

> Instead of asking Lord Salisbury, in Parliament, what he means to do in regard to Venezuela, Mr. Labouchere will surreptitiously photograph the Premier's brain, and publish a 'processed' copy of the photograph in *Truth*.[24]

Polite society will crumble, jokes Alden, as dishonesty becomes impossible. Pain is sensitive to the same concerns – '[o]ne would never be able, with any feeling of confidence, to sell a horse to one's best friend, or to attend as sole legatee the funeral of a distant and very wealthy relative' – but obligingly makes his equipment too bulky to be used covertly.[25]

In both Alden and Pain's pieces, a concern over the future of privacy in the face of new and increasingly intrusive scientific developments masks a tacit assumption about the objectivity of interior truth which is, at first, easy to miss.

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[23] Archibald Mosely Damstruther and Barry Pain, 'The Treble-X Rays', *Pearson's Magazine*, 9 (June 1900), 677–80 (p. 678).
[24] W. L. Alden, 'Wisdom Let Loose', *Pearson's Magazine*, 1 (May 1896), 524–28 (p. 524).
[25] Damstruther and Pain, p. 679.

At some point roughly halfway through the Pain article, the Treble-X Rays stop being a device for photographing thoughts and, that process 'invisibled' like the apparatus itself, start revealing incontestable facts. Their use in court would be revolutionary, says Damstruther, for 'the record would give Mr. Sykes's real thoughts, not the thoughts that he would have liked us to think that he thought' (p. 680). Both Pain and Alden extrapolate X-rays into a sort of universal lie detector, able to reveal hidden facts about the mind just as their real counterparts reveal hidden facts about the body. The notion is a fascinating one, especially when raised by Pain, who spent the whole of the 'Nature's Next Moves' series revelling in factual ambiguity surrounding his own authorship. The byline to each instalment reads 'SUGGESTED BY ARCHIBALD MOSELY DAMSTRUTHER AND EDITED BY BARRY PAIN' despite the fact that we as readers know the former to be a fictitious creation of the latter, and Pain is clearly enjoying the obvious inauthenticity of the documents he is supposedly merely editing when he writes (as himself) in his short, italicised introduction to the piece that 'no actual guarantee is given as to the exact amount, if any, of pure science in this article' (p. 677). Likewise, Alden's mention of 'a 'processed' copy of the photograph in *Truth*' casts a wry smile at the supposed objectivity of the thought-rays: the inverted commas around 'processed' highlight the fact that all photographs are mitigated by reproductive technology and subject to various kinds of editorial control (see section four, below), whilst the italics on '*Truth*' not only denote a publication but place sarcastic emphasis on the concept of truth within the context of the periodical press. *Truth* would not have been a random choice for Alden: its editor, Henry Labouchere, advocated the introduction of the first-person to journalism in the belief that the press should 'be open and candid in its politics, and that it [should] not hide behind a veneer of independence or omniscience'.[26]

Aware of their satire's dependency on ambiguity, Alden and Pain both write to address the philosophical conundrums arising from the idea of ultimate interior truth. Alden's paragraph on brain photography comes immediately before a section which I discuss at greater length in chapter 4: a call for Antarctic exploration to cease in order that there might be left on Earth one place to which

[26] Gary Weber, 'Henry Labouchere, *Truth* and the New Journalism of Late Victorian Britain', *Victorian Periodicals Review*, 26 (1993), 36–43 (p. 40).

the human imagination can continue to ascribe fantasies. 'Any scientific discoveries that the expedition may make', claims Alden, 'will not be half as interesting as the stories which the romance writers will give us'.[27] In their light-hearted scepticism of science, it's the idea of there being a final truth to discover which these two writers find the most alarming.

Mind-reading was a potential consequence of X-rays which others besides satirists were dwelling on. 'There are few persons who have not felt at least a curiosity as to the recent announcement that it was now possible to photograph thought', wrote Stead in his review of occult publications, *Borderland*:

> The presentation of our bones, or the matter of our brain, or the action of the heart, by the 'X' rays would be far transcended in importance, if it were once established that we could procure a permanent record of our passing moods and fancies.[28]

The passage bears distinct resemblance to that in which Pain explains:

> By the X Rays you can detect the bones in the hand or the farthing in the offertory bag. By the Treble-X Rays you will be able to detect the thoughts in the head. Does that not sound useful?[29]

The only real difference between these two passages is tonal, because Pain, unlike Stead, is joking. But *Borderland*, a shilling quarterly aimed at uniting Britain's disparate spiritualists, addressed many of the same concerns and fantasies as the satirists in its apparently factual coverage of psychic photography. In April 1897, for example, it excerpted a story from *The Light of Truth* (another significantly-named publication for my purposes) under the subheading 'Yarns about the X-rays' (a noteworthy title, given the factual ambiguity implied by 'yarns'[30]). The piece relates that J. R. Cocke, blind from birth, was supposedly able to describe the outline of objects held between his brain and a powerful beam of X-rays: 'it seems as if the cortex or outer shell of the brain were rendered fluorescent, like the sensitive plate, and the shadow of

[27] Alden, 'Wisdom Let Loose' (May 1896), p. 526.
[28] 'Psychic Photography', *Borderland*, ed. by W. T. Stead, 3 (July 1896), 313–21 (p. 317).
[29] Damstruther and Pain, p. 678.
[30] 'a (long) story or tale: sometimes implying one of a marvellous or incredible kind; also, a mere tale' ('Yarn, N.', *OED Online* (Oxford: Oxford University Press, 2011)).

these objects was communicated to it and then transmitted to the visual areas at the posterior part'.[31] Here, the brain is part of the photographic equipment rather than simply its object. Technology is therefore invisibled to a whole new degree: it has become integrated with the body, the brain as photographic plate. A technological process is again being elided, this time by being relocated within the mystified human body.

An even more pronounced example, and one with even closer narrative resemblances to Pain's, is to be found in *Borderland*'s reports on the 'dorchagraph' experiments of Andrew Glendinning. With the help of a medium, Glendinning purported to be able to conjure photographs without a camera simply by holding on to an undeveloped plate. When developed, the plates showed images (generally profile photographs of people) and, less frequently, text (handwriting) from the mind of one of the subjects. The human brain here becomes the camera itself, and the X-rays are less visible than ever, Stead commenting:

> …we have here a discovery which throws that of the X-rays into the shade, for it is much more marvellous to photograph an object that does not exist, save in the thought of an operator, than to photograph a coin that has lodged in a man's throat…[32]

This one-upmanship of materialist science – it is 'much more marvellous' here to transcend the drudgery of facts than it is to be medically useful – is aptly expressed as a light/dark metaphor and underlines the fact that both this story and the report from *The Light of Truth* harbour the same distrust of objectivity as Pain and Alden. To Stead, the strongest recommendation of Glendinning's theories is not his evidence but his trustworthiness as an operator ('He is certainly incapable of making any statement that he knows to be false. A more upright man does not live'[33]) whilst Cocke's success as a photographic plate is due to his exceptional prowess as a perceiver (whether the experiment would work 'in brains less acutely sensitive and magnificently developed is questionable'[34]).

[31] 'Miscellaneous', *Borderland*, ed. by W. T. Stead, 4 (April 1897), 200–06 (pp. 200–1).
[32] 'Psychic Pictures Without the Camera: A Confirmation of the Dorchagraph Discovery', *Borderland*, ed. by W. T. Stead, 4 (January 1897), 26–32 (p. 27).
[33] Stead, ed., 'Psychic Photography', p. 312.
[34] Stead, ed., 'Miscellaneous', p. 200.

The favouring of witness testimony over verifiable evidence falls in line with *Borderland*'s wider project, outlined in the prospectus Stead published in *Review of Reviews* prior to its launch:

> In *Borderland*, we shall take nothing for granted. Whether on one side or the other, our experience of the immeasurable vastness of the universe, even of material things, and of the constant dogmatism and pharisaic intolerance of men of science when face to face with a new truth, compels us to *refuse to rule out as manifestly incredible even the most incredible statements which are vouched for by trustworthy witnesses*.[35]

The philosophy of this last phrase is the direct opposite of the Royal Society's more famous (and more succinct) 'Nullius in Verba'. Far from not taking anyone's word, Stead proposes to implicitly believe anyone he likes. He opposes this approach to that of 'the men of science', the closed-minded materialists who refuse to entertain the notion that there are more things in heaven and earth. The accusation of hypocrisy implicit in 'pharisaic' is especially interesting given that Stead's declared intention in the previous sentence to 'take nothing for granted' *does* sound similar to the spirit in which the Royal Society was founded, and there are other areas in the same article in which Stead has clearly been deeply influenced by scientific approaches:

> The wish is so often father to the thought that it is necessary to scrutinise more closely the evidence that seems to tell in favour of a conclusion that we desire than the facts and arguments which point in the opposite direction.[36]

This is a point with which any scientist (of Stead's day or ours) would have no difficulty agreeing. As indicated by his use of the phrase 'scientific imagination' in the quotation with which I began this chapter, Stead considered his project to be in many respects an avowedly empirical one. The problem *Borderland* exists to address, he says, is that occult phenomena have not been subjected to 'close systematic and sustained investigation' (p. 675). Far from being straightforwardly antiscientific, Stead invokes Darwin as a role model.

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[35] [Stead], '"Borderland", A New Quarterly Review and Index', *Review of Reviews*, 7 (June 1893), 675–78 (p. 677). My emphases.
[36] [Stead], '"Borderland"', p. 678.

Borderland's role is as an index, and the painstaking nested lists of the different branches of occult investigation in its *Review of Reviews* prospectus are an attempt to bring order to a chaotic and unorganised field of 'study' by the imposition of something approaching Linnaean taxonomy. In short, *Borderland* was supposed, by uniting the currently disparate subfields of occultism into common correspondence, to make a science out of the supernatural: to apply 'the methods of research, which have yielded such brilliant results in the material sphere, to the fitful phenomena of the borderland' (p. 675).

The *Review of Reviews* article is perhaps best considered a manifesto for Stead's forthcoming publication, and is significant because it makes clear that *Borderland* was attempting to do with the occult press what *Review of Reviews* was doing with more mainstream publications – provide a continuously-updating index from across a spectrum of publications.[37] This taxonomic project was, for Stead, journalism *as* science – a form of science which became increasingly conflicted when pushed into the fictive universe of the borderland.

The Sozodont advert, the satirical musings of Alden and Pain, and Stead's coverage of thought photography in *Borderland* are different reactions to the appearance of X-rays, but all have three things in common. The first, shown above, is that all share an interest in eliding the scientific side of the discovery, making it 'invisible' and focussing on social or spiritual effect over technological process. The second is that this very characteristic, along with several key details of the way it is expressed (consider again the techno-fetishist aesthetic of the Sozodont advert, the thought-reading machines of Alden and Pain, the brain/technology integration of J. R. Cocke) place them on a similar imaginative plain to sf.[38] The third, which, I suggest, is closely related to the first two, is the co-location of these pieces within the monthly magazines, and specifically their links with the project of New Journalism. It is this crucial aspect of the periodicals' reception of X-rays that I shall continue to examine in the next

[37] Another early appearance of the idea which became *Borderland*: 'A periodical which surveyed the whole obscure field with the calm and impartial eye of the scientific enquirer, which investigated all phenomena without prejudice or superstition, might considerably enlarge the sphere of human knowledge, and reduce to something like scientific certainty many crude ideas on things now supposed to be almost unknowable' (W. T. Stead, 'Preface', in *Index to the Periodical Literature of the World (Covering the Year 1891)* (London: Review of Reviews, 1892), pp. 5–6 (p. 6)).

[38] As usual, this is distinct from a claim that the pieces described in this section *are* sf – the point here is about proximity of different textual forms and the discourses between them which the general magazine enabled.

section, which addresses itself to that quintessentially New Journalist form, the illustrated interview.

III. Interviews: Fiction Stands In for a Reluctant Subject

H. J. W. Dam's seven-page interview with Wilhelm Röntgen appeared in *Pearson's Magazine* less than three months after the discovery of X-rays had been translated into English. It takes a form which would have been familiar to any *fin de siècle* magazine reader: a few pages of introductory biography followed by a transcription of a laconic chat between interviewer and interviewee. Like most reporters in interviews from this era, Dam writes avowedly in the first person, breaking off occasionally to supply his own interior monologue. The interview takes place in Röntgen's lab: most such chats took place in either the workplace or home of the interviewee, capitalising on the chance to describe their subject's lifestyle as well as their personality.

In one respect, though, Dam's article is somewhat atypical: illustration. Most pieces of this kind were rife with photographic accompaniments to the reporter's descriptions – pictures of the various rooms of the building, often with the interviewee in situ at a writing desk; pictures showing the exterior, the rest of the interviewee's household; occasionally photographs from earlier in the interviewee's life, generously provided by themselves – but though Dam's piece is heavily illustrated, only one picture shows Röntgen, and this is obviously a 'stock photo'. Most of the other pictures are X-ray photographs, all of which are noted as being from sources other than Röntgen himself: the first two were taken by a Professor Spies, a photograph of whom is also added to bulk up the illustrated content, and the others, commissioned especially for *Pearson's Magazine*, are credited to A. A. C. Swinton, the scientist who wrote the commentary which followed the translation of Röntgen's original paper in *Nature*. There is one exterior shot of Röntgen's lab, but this is taken from the other side of a rather large fence (Fig. 3.3).

It wasn't at all unusual for images of an interview subject's scientific work (when the subject was a scientist) to appear in print, but there is something unusual about the lack of personal images to complement them here. Dam is

unafraid to draw attention to this, saying, after his offer to buy the table on which the scientist conducted his first X-ray experiments is refused, '[a] photograph of it would have been a consolation, but for several reasons one was not to be had for the present'.[39] After Röntgen demonstrates how, sitting at the table, he first photographed his own hand through it, Dam reports the following exchange:

> 'You ought to have your portrait painted in that attitude,' I suggested.
> 'No, that is nonsense,' said he smiling.
> 'Or be photographed.' This suggestion was made with a deeply hidden purpose.
> The rays from the Röntgen eyes instantly penetrated the deeply hidden purpose. 'Oh, no,' said he, 'I can't let you make pictures of me, I am too busy.' Clearly the Professor was entirely too modest to gratify the wishes of the curious world.[40]

In this room full of imaging technologies – not only the Crookes tubes but the penetrating scientific eyes of Röntgen himself, which here, unlike normal eyes, emit rays as well as receiving them – Dam finds himself unable to get pictures. The Professor is scarcely more forthcoming about his personal history. After a three-sentence summary of his subject's career to date, Dam notes:

> These details he gave me under good-natured protest, for he quite failed to understand why his personality should interest the public. He declined to admire himself or his results in any degree, and laughed at the idea of being famous. He is too deeply interested in science to waste any time in thinking about himself.[41]

Röntgen wants to demonstrate the X-rays, and whilst Dam is clearly interested too, he is also invested in shoring up the 'great man' narrative and providing the public with insights into the private life of a celebrity. The comparison between the two men and their preferred types of photograph is an apposite one – Röntgen, with his penetrating gaze and X-rays, wants to get at interiors; Dam, with notepad and camera, is interested in surfaces. The last sentence of this quotation even suggests that Röntgen's love of science and his unwillingness to

[39] Dam, p. 418.
[40] Dam, p. 418.
[41] Dam, pp. 415–6.

give out personal images can be equated. An apparently objective observer, he has no interest in being someone else's subject.

Subjectivity, however, is at the heart of the celebrity culture into which Dam is trying to introduce Röntgen. This is vigorously expressed in George Griffith's short story 'A Photograph of the Invisible', the first piece of fiction in English I have been able to find which makes use of the discovery of X-rays. It should be regarded as a companion piece to Dam's interview for several reasons: not only does it appear in the same issue of *Pearson's Magazine* (April 1896) but it is actually mentioned by Dam, who devotes a paragraph of his introduction to it:

> Not long ago [Griffith's] story would have been read with utter incredulity, possibly not unmixed with ridicule, but by the time the reader has reached the end of this article he will have learned that the story might, without the alteration of a single detail, be accepted as a narrative of actual fact.[42]

Explicit inline linkages like this between two items in the same issue were extremely rare in these publications. I suggest in what follows that Griffith's fiction fills some of the gaps in narrative and imagery that Röntgen is disinclined to fill himself.

'A Photograph of the Invisible' revels in the full gothic potential of X-ray images. Professor Grantham, 'a chemist and physical investigator by profession, […] a photographer by hobby' comes to the aid of his friend, Denton, who has been wronged in love by an unnamed woman, and seeks revenge.[43] Grantham's scheme is scientifically up-to-the-minute. Taking advantage of his reputation as a society photographer, he offers to take a portrait of the lady. Unbeknownst to her, he substitutes X-ray equipment for his regular camera. As anticipated by the two men, the unexpected sight of her living skeleton has a profound effect on the woman, who ends up in a private asylum. There's a lot which could be said about this story, which is racist as well as sexist (the woman's crime is to have married a 'German Jew brute and his millions' instead of Denton), and in which amoral, dispassionate science is the narrative source of justice ('I can give you a revenge

[42] Dam, p. 414.
[43] George Griffith, 'A Photograph of the Invisible', *Pearson's Magazine*, 1 (April 1896), 376–80 (p. 378).

that shall be purely scientific…', p. 376) but this chapter's argument is best served by reading the tale in terms of its use of images.

The tale's dénouement comes with the description of the horrible photograph arriving at the breakfast-table of its unfortunate victim and her now-husband, Mr Goldsberg. 'Neither of them said anything when they first saw what was underneath', Griffith tells us, and indeed, from this moment onwards there is no more dialogue in the story (p. 379). Griffith first describes the Goldsbergs' physical reaction to the image, then he describes the image itself. The two complement each other, for both are presented as 'stills' – the couple's reaction is devoid of sound and movement, described in purely visual terms, he becoming 'almost purple', she 'grey and white and ghastly'. The pair are as static as the picture they regard, a picture of the lady whose dress is described in similar terms, 'diaphanous and transparent'. Mrs Goldsberg's X-rayed skull 'seemed to stare at her out of the sockets in which two ghostly eyes appeared to float', and this is a stare which she returns, her face becoming that 'of a corpse, but for the two bright, glaring eyes that stared out of it' (p. 380). Mrs Goldsberg's similarity to her distorted likeness is emphasised by the presentation of her reaction, and that of her husband, as a tableau – a literary device complimented by the story's final illustration, the work of G. G. Manton, which shows the couple freeze-framed, the X-ray turned away from the viewer's perspective.

Griffith doesn't restrict himself to using photography for the plot – he considers the new X-rays by offering a fictitious moment in which a number of crossing gazes are foregrounded. The couple stare at the X-ray; the X-ray stares at the couple; we, the readers, stare at both. In the next paragraph, we learn that the moment is also keenly regarded (within the story's world) by readers of the society journals, and it's through their far more distant eyes that we find out what happens after the intricately-described tableau: 'A day or two afterwards Society was startled by an amazing piece of news concerning the golden idols which it had most recently set up...' (p. 380). This is a distance in time as well as in space – in the space of a few lines, readers have gone from being in the narrative presence of events to learning of them via hearsay.

This news is not quite the last word of the story. There follows an italicised editorial note:

> *Although this is of course a purely imaginative story, it may be as well to say that such photographs as that of Mrs. Goldsberg have been shown by actual experiment to be possible.*[44]

The insistence on plausibility here matches the testimonial which Dam gives in the introduction to his piece: despite being fiction, Griffith's story wields the narratives and, more, the iconography of fact. Unlike the material discussed in the previous section, Griffith's is a story in which the processes of early radiography are scrupulously observed and reported, the middle of the story being a fairly meticulous demonstration of the methods by which Grantham takes his pictures. The tacit and overt assertions of realism from both Griffith and Dam draw attention to the fictive feel the X-rays engendered in a world not used to them, but they also serve to legitimise the story as a companion piece to Dam's interview. With its abundance of sensational images, both textual and visual, Griffith's story fills those lacunae in the interview which Röntgen is unwilling to address. Where Röntgen will not give details of his personal life, Griffith's story is almost entirely given over to Grantham's extracurricular pursuits. Where Röntgen wants to explain science, Grantham says 'I can see you are impatient, and no doubt naturally. We'll let the explanation go for the present' (p. 377). Where Röntgen is unwilling to provide his companion with images, Grantham suggests the scheme for the reluctant Denton's revenge himself, and is active in persuading him to go through with it.

Safe in the realm of fiction, a realm designated by, among other things, its style of illustration (hand-drawn rather than photographic), Griffith's story nonetheless functions as a factually-empowered piece of wish-fulfilment for the interview in which Röntgen resists Dam's strong desire to sensationalise. The bleed area between the two pieces is considerable; it is certainly not obvious from the titles 'A Wizard of To-Day' and 'A Photograph of the Invisible' that the latter is the one which is fictitious. Although readers would have been unlikely to approach a magazine so large and varied as *Pearson's Magazine* in strict page order, it is also tempting to suppose that Griffith's appearance much closer to the front of the magazine (his is the third item in the issue; Dam's is ninth) belies an editorial preference for narrative over fact. Some weight is given to this

[44] Griffith, 'Photograph of the Invisible', p. 380. Original emphasis.

supposition by the editorial at the end of the previous number, which advertised the two pieces by saying:

> Mr. George Griffith will contribute a very striking story, which he calls 'A Photograph of the Invisible', and which *is emphasized by* an important interview with Dr. Röntgen…[45]

Regardless, however, of how Pearson himself conceived the relationship between the story and the interview, their co-incidence in the same issue of the magazine certainly allowed each to support the wider project of New Journalism, Dam's science authenticating Griffith's fiction, Griffith's fiction sensationalising Dam's science. The implied collaboration also demonstrates the relentless newness of *Pearson's Magazine*: Dam highlights the effect of scientific development on the authority of fiction when he remarks of Griffith's piece that further X-ray developments 'will have removed it from the region of romance to that of the commonplace'.[46] And by drawing attention to the fact that these pieces can be consumed in either order (or not at all) the linkages between them underscore New Journalism's most important subjectivity – that of the reader. The 'chat' takes place not just in Dam's interview but between it and the rest of the magazine, and between the entirety of the magazine and the individual who reads it. It is noteworthy, though, that the supportive role in which science is deployed here is not compatible with an abstract scientific worldview – Röntgen's agenda, in this issue of Pearson's, is disadvantaged in a way that Griffith isn't.

IV. Interviews: Breadth of Images Support an Enthusiastic Subject

On the seventh of the eighteen pages of Roy Compton's interview with the artist and war illustrator Frederic Villiers in the September 1897 *Idler* – another New Journalist 'chat' – an X-ray photograph sits in the midst of text which makes no reference to it. The radiograph, which is of Villiers's right hand, is taken by the well-known physicist Silvanus P. Thompson – this much the caption tells us – but it is left to the reader to guess as to why the image might be

[45] C. A. Pearson, 'The Editorial Mind', *Pearson's Magazine*, 1 (March 1896) p. 352A. My emphasis.
[46] Dam, p. 414.

deemed interesting or relevant (Fig. 3.4). The obvious conclusion is that the image is intended to provide insight: this is, after all, an interview piece, its purpose to give the reader hithertofore unknown depth of vision into the life and work of a celebrity. The never-before-seen rendition of the hand with which Villiers executed his work is implicitly an insight into the skill which made him famous: a penetrative glance at his body is supposed to penetrate his craft also.

We, who are more used to X-rays of hands and prepared for the reality that those of skilled artists look similar to those of everyone else, perhaps find the inclusion of this image curious. But there are perspectives from which its appearance makes perfect sense. Villiers is not Röntgen. Indeed, his pliancy in interview makes him almost the opposite. For the whole chat, he leads the way with anecdote after anecdote about his long career. Sentences are long and colourful: 'It was in the historic town of Belgrade I first heard the clang of war, the noise of the smith's hammer, the tramp of troops, the clinking of orderlies…'.[47] The actual process of painting a picture, the closest thing to an equivalent of the science on which Röntgen wishes to dwell, goes entirely unmentioned. Unlike Röntgen, Villiers recognises that he is being interviewed as a personality, and presents himself as such.

The images on display in the interview form an embarrassment of riches. Of twenty-four pictures, sixteen are examples of Villiers's artwork (sketches and paintings); four are photographs of Villiers himself, his studio, or both; three are photographs taken by Villiers on his travels around the world; and one, of course, is the radiograph. The images are dispersed fairly evenly throughout the piece. Five of them are whole-page images – more or less normal in an interview with an artist, especially in the post-1895 *Idler*, but still extravagant compared to most other articles. Implicitly, the pictures are all sourced from Villiers, or with his permission.

These numbers suggest more than simply that Villiers was a willing subject in a way which Röntgen wasn't. They also show us that articles like this one drew some of their strength from a collage effect, variety in types of image as well as in their images' subjects. The vast majority of the images here are paintings and sketches – after all, they are the basis of Villiers's celebrity – but

[47] Roy Compton, 'Mr. Frederic Villiers', *The Idler*, 12 (September 1897), 238–55 (p. 246).

the variation in tone provided by the others is a key part of what made the New Journalism unique, says Gerry Beegan:

> This kind of [written] material had been a feature of the working-class press since at least mid-century. […] What was novel in the 1890s was the bringing together of all of these elements for a broad middle-class audience in a lively visual format that incorporated more illustration.[48]

Beegan isn't just talking about quantity of images here. Arguing against the notion that the advance of printing technology resulted in photography simply replacing older types of illustration, he says:

> …overall the photograph was one of a range of different kinds of image used. Line and halftone processes added to the imaging possibilities, making the visual content of periodicals more abundant, complex, and increasingly hybrid.[49]

In this conception, the X-ray encountered in the Compton article is part of the *Idler*'s visual hybridity; another way of stressing the newness of New Journalism, print technology's ever-improving ability to deal with different types of image alongside each other. Illustrated monthlies expressed their diversity and inclusiveness not just in the fertile co-existence of their wildly differing contents, but also in the range of their visual styles.

James Mussell, arguing that the main function of photography in the magazines of the 1890s was to engender a sense of simultaneity, has noted of the X-rays that it was their value as curiosities rather than any actual enhancement of perception which made them attractive to editors: 'these images […] presented familiar objects in strange ways'.[50] As well as stressing the unique level of access to the subject which the *Idler* has managed to attain, then, the radiograph in the Villiers interview uses the iconography of science to assert the magazine's location in the present tense – not just a photograph, mass reproduction of which

[48] Gerry Beegan, *The Mass Image: A Social History of Photomechanical Reproduction in Victorian London* (Basingstoke: Palgrave Macmillan, 2008), p. 5.
[49] Beegan, p. 8.
[50] James Mussell, 'Science and the Timeliness of Reproduced Photographs in the Late Nineteenth-Century Periodical Press', in *The Lure of Illustration in the Nineteenth Century: Picture and Press*, ed. by Laurel Brake and Marysa Demoor (Basingstoke: Palgrave Macmillan, 2009), pp. 203–19 (p. 214).

was itself comparatively new, but a specific *kind* of photograph which was unheard of less than two years ago.

Mussell stresses that these magazines sought to entertain rather than to inform, and this explains the variety of images and kinds of image on display, not just in the 'Curiosities' section of the *Strand* (the example Mussell uses; a section at the back of each issue which reproduced strange photographs with minimal commentary), but throughout. As a part of this spectrum of images, X-rays were useful because of their scientific currency (in all senses of that word). The crucial point, though, is that their visual appeal and newness were more important to editors than their scientific application. This much is evident from the way the radiograph of Villiers's hand is inserted without comment – it 'goes without saying' that such an image is an important way of understanding a celebrity, whilst the visual diversity of the article to anyone flipping through the magazine is very much in the foreground.

It was the iconography of X-rays, then, rather than the X-rays themselves, which lent interest to articles. This can be seen even in places where X-rays are never used or mentioned by name. A good example is Marcus Tindal's curiosity piece for *Pearson's Magazine*, 'Skeleton Leaves'. Published in the November 1897 issue, this article instructs the reader in the basics of stripping the flesh away from leaves, so that only their veins remain. Particularly effective with ferns and ivy, this hobby is reported as being an excellent way of creating objects which appear 'carved in white ivory, so delicate are the veinings'.[51] This is not simply about craft, though, but perception also: 'no human hand was ever skilful enough to imitate the wonders of nature *hidden away beneath* what one is tempted to look upon as merely "ordinary leaves"' (pp. 494-95). The process also serves, therefore, to 'present familiar objects in strange ways', highlighting a gaze into nature's interiors implicitly connected to X-rays via the use of the word 'skeleton'.

If this were all, the links to Röntgen's discovery would be clear enough. But the images which Tindal puts alongside his words make the resonances even stronger. Over its five pages, the article has twelve photographs of skeleton leaves which have been arranged as decorative borders for pictures of celebrities including Queen Victoria, Gladstone and Pope Leo XIII (Fig. 3.5). 'The

[51] Marcus Tindal, 'Skeleton Leaves', *Pearson's Magazine*, 4 (November 1897), 494–98 (p. 494).

accompanying illustrations will prove', Tindal remarks, 'that there are few more effective frames for photographs than a tasteful arrangement of these delicate skeletons' (p. 495). Here, in a display which befittingly embodies the attitude of the press to X-rays outlined above, these quasi-scientific bouquets provide ornamentation and interest to snapshots of famous personalities. This fact is enhanced by a diversity of types of image, for as they come to us in the magazine these are photographs *of* photographs (or woodcuts, when the celebrity being displayed predates photography). Images here frame other images.

The chaotic effect of this profusion of layered images has been alleviated with consistent editing. All the photographs have been cropped in the same stylised fashion: the top two corners rounded off – their contents are diverse, yet they have been harmonised by the formatting decision. The visual diversity is enhanced by the line drawings of skeleton leaves which form the piece's header and footer, and which juxtapose the rather solid photographs which form the article's contents (Fig. 3.6). This is very much in line with Stead's ideal of the editorial process, in which the personality of the editor is the reconciling force between the various and superficially conflicted interests of their paper.[52] The treatment of the skeleton leaves in Tindal's piece highlights the fact that photographs in the 1890s press, like everything else, were inevitably subject to editorial control. It is worth remembering that this was partly out of mechanical necessity: the (by our standards) primitive reproduction technology still required physical craftsmanship to create well-balanced images, just as the leaves, provided by nature, require human craftsmanship to be attractively skeletonized. Due to this material fact, and to the (far from unrelated) journalistic ideals of the day, photography was more often about narrative truth than literal truth, as Beegan points out:

> [Photographs in 1890s magazines] were created within the existing reporting practices of the illustrated magazine, and, as such, they aimed to produce a meaningful representation of an event rather than 'capture' a fragment of reality.[53]

[52] See W. T. Stead, 'The Future of Journalism', *Contemporary Review*, 50 (November 1886), 663–79 (p. 664).
[53] Beegan, p. 165.

We can also see journalism making a more overt than usual appearance in Compton's interview, for as well as the assertive first-person of the interviewer's voice, there is the fact that Villiers, a battlefield illustrator, is himself a kind of journalist – one who specialises in producing a variety of images in order to propagate a specific kind of truth about the frontier for the press. Villiers and his colleagues placed an importance on a certain code of authenticity in reporting but were nevertheless unlikely to produce (or at least, see printed) images of, say, the British concentration camps in South Africa during the Boer War.[54] Equally, Tindal's piece is empowered to a certain extent by scientific ideas (the camera, the X-ray, and natural history, in particular the concept of 'collecting'), but not ultimately in thrall to them. Indeed, the images he presents, in which skeletons surround a photograph – the medium of image which, Grove says, 'itself is a type of ghost, a spooky throwback to the past' – against a solid black background cropped into the unmistakable shape of a tombstone, speak more to the gothic imagination than to the scientific.[55] Over the last few sections, I've been beginning to make the case that it's the insistence on diversity, both in images and text, which makes scientific interest subordinate to imaginative entertainment in these magazines. I will now carry this notion into a reading of some science-fictional stories, tracing in their fear of the X-ray discovery not a scepticism of science so much as a scepticism of the totalising world view which it inevitably brings with it.

v. The Other Invisible Man

L. T. Meade's series of detective adventure stories *The Brotherhood of the Seven Kings* was serialized in the *Strand* from January to October 1898. Written, like much of her work, in collaboration with a scientist (in this case Robert Eustace), the stories tell of the adventures of Norman Head, who battles an ancient secret society in an attempt to bring to justice its leader, the cunning Mme. Koluchy. Despite Eustace's involvement, Meade's engagement with

[54] For a discussion of truth values in war illustration during this period, see Glenn R. Wilkinson, *Depictions and Images of War in Edwardian Newspapers, 1899-1914* (Basingstoke: Palgrave Macmillan, 2003).
[55] Grove, p. 144.

science is often decidedly superficial, and the scientific knowledge employed by Head and Koluchy in their contest with each other is more often elementary physics than anything decidedly new. However, in the June 1898 instalment, 'The Star-Shaped Marks', the X-rays make an appearance. The striking twist is that Meade conceives them not as an imaging technology but as an assassination device.

It is unnecessary to sum up the entire plot of this rather convoluted story. What matters is that during an investigation, a person whom Mme. Koluchy wishes removed, Mr Durham, suddenly sickens without any apparent cause. Lady Faulkner, an accomplice of Koluchy's unaware of her murderous plans, is in a position to explain the initial crime to the detectives. As she is strong of will, though, nothing can induce her to make a confession until she sees Durham apparently on his death-bed. She tells all to Head and his associates, who then set about finding out why Durham is dying. Head finds star-shaped marks on the sick man's body, which remind him of those he has noticed on photographic plates during X-ray demonstrations. Breaking into the adjacent house, they find 'an enormous focus tube, the platinum electrode turned so as to direct the rays through the wall' into Durham's bedroom.[56] Head explains:

> Constant powerful charges of cathode and X-rays, such as must have been playing upon Durham for days and nights continuously, are now proved to be so injurious to life, that he would in all probability have been dead before the morning.[57]

This discovery is the dramatic climax of the story, and takes place on its final page. Koluchy's baseness is in her subversion of the X-ray technology, using it to produce imagery of death on the living body rather than on the photographic plate. But beyond a straightforward scepticism about the possible applications of radiography, it's possible to observe in Meade's ordering of the narrative a similar de-prioritisation of objective truth to that I have already shown taking place in various non-fiction.

With the X-ray revelation coming only at the end, the bulk of Meade's story is geared not towards detecting the manner in which Durham is becoming

[56] L. T. Meade and Robert Eustace, 'The Star-Shaped Marks', *Strand Magazine,* 15 (June 1898), 649–64 (p. 664).
[57] Meade and Eustace, p. 664.

ill (he develops symptoms only two thirds of the way through) but rather towards extracting a confession from Lady Faulkner. Head's method of investigation is, in this respect, curious. Lady Faulkner has no information as to how Durham is being killed – her information only helps Head understand the other, related crime, the crime which the murder of Durham is intended to conceal. When he gets around to it, Head discovers the mode of assassination in a (rare) demonstration of his own scientific abilities, and with no outside help. However, he doesn't even attempt this until *after* Lady Faulkner has been led into a separate room and told him the entire back-story. This takes nearly three pages to relate, and all the while Durham is dying upstairs.

Why does Head stop to listen to this exposition when he already has everything he apparently needs to save a man from a slow, painful death? This is not the only time in his adventures when he is slow to act, and his speed always seems to stem from the fact that he needs to be in control of the *narrative* elements of a case before he can solve it, regardless of whether or not those elements are clues. In other words, this scientific detective's struggle is for comprehension of a story, not for comprehension of a set of facts around a case. Only with the narrative understanding of the events leading up to the attempt on Durham's life is Head released by generic conventions to actually find out what is killing him.

Immediately after the narrative revelation comes the moment of Head's epiphany:

> Once more I bent over Durham, and as I did so the memory of where I had seen similar markings returned to me. I had seen them on photographic plates which had been exposed to the high induction action of a brush discharge of high electro-motive force from the positive terminal of a Plante Rheostatic machine.[58]

The 'once more' at the start of this extract shows how well the narrative revelation has served to refresh Head's memory – only *this* time is the truth printed on Durham's body legible to him (and, consequently, to us). The following burst of jargon about 'high electro-motive force from the positive terminal' (which is incongruous with the rest of the story's tone, and which we

[58] Meade and Eustace, p. 622.

may perhaps safely attribute to Eustace) demonstrates that in Meade's universe scientific truths, like the marks of the X-rays, are comprehensible only after narrative truth has been determined. This is equally so when the X-rays are on the side of good rather than evil: in an earlier detective story written by Meade in collaboration with Clifford Halifax, X-rays are used to confirm an already strong suspicion about the location of a jewel (in the body of its thief), providing evidence for the authorities in the story but doing nothing to further the narrative, which has already more or less concluded before the X-rays make an appearance. The story celebrates both the newness and the forensic utility of X-rays, but also includes a dangerous character who has stolen some anhydrous hydrocyanic acid – apparently a by-product of X-ray experiments – from the narrator: 'It causes death by inhalation, and the process of making, without certain precautions is fatal'.[59]

Meade, then, presents a conflicted attitude towards the X-rays: knowledge of them thwarts crime, but also abets it. A story with less equivocal opinions appeared in *Longman's Magazine* in September 1896. 'Röntgen's Curse', by C. H. T. Crosthwaite, is one of the earliest stories which deals with the idea of 'X-ray vision', but this is no Superman-style fantasy about perfect depth of gaze. The narrator is scientist Herbert Newton: 'I had found at last how to make a liquid which, applied to the eyes, might make them sensitive to the X-rays, and perhaps to other waves of ether yet unknown'.[60] Newton first applies the preparation to the eyes of his faithful dog, and then, failing to be warned by the creature's subsequent insanity (and eventual death), to himself. Finding himself in a 'fantastic and ghostly' world in which his wife and children are hideous grinning skeletons, Newton attempts to combat his guttural fear with higher scientific reasoning, but, failing, has a reaction similar to that of the Goldsbergs in George Griffith's 'A Photograph of the Invisible' and is on the verge of complete mental collapse when the effects of the potion unexpectedly wear off. No-one will believe that his tribulations were not the result of a delusion brought on by working too hard, and even Newton himself has doubts: '[i]f it had not been for the fate of my poor dog, who had not shared in his

[59] L. T. Meade and Clifford Halifax, 'The Snake's Eye', *Strand Magazine*, 12 (July 1896), 57–68 (p. 60).
[60] C. H. T. Crosthwaite, 'Röntgen's Curse', *Longman's Magazine*, 28 (September 1896), 468–85 (p. 472).

master's scientific labours, I might have persuaded myself that I had been the sport of a diseased imagination' (p. 484).

With its romantic and magical language (from the 'curse' in the title onwards), Crosthwaite's is a tale in which the scientific ideology fares badly. Though Newton's final conclusion is simply that he is himself 'not the stuff of which the pioneers and heroes of science are made' – an inadequate test subject, in other words – Crosthwaite has a deeper distrust, closing the narrative by having Newton send his formula to an elderly German professor judged to be a more dispassionate and capable investigator (p. 484). That professor's death, which is reported in the story's final paragraph, not only shows the depth of Crosthwaite's scepticism (it isn't just that Newton is inadequate; not even a seasoned and initially optimistic Professor can handle the horror) but is also finally ambiguous. Like the future-prediction texts delighting in vagueness which were my subject in chapter 2, Crosthwaite's final sentence revels in its unanswerable question:

> Whether he died from natural causes, or whether he found life under such conditions a burden not to be endured even by a German savant, who can tell?[61]

Even people who are convinced that nothing has actually happened to Newton believe that his scientific investigations are the cause of his breakdown. Both his doctor, to whom he tells the truth, and his wife, from whom he conceals his X-ray vision, are of the opinion that his obsession with his work has made him delusional: 'you are rather run down from too much work and too little air and exercise' (p. 481). When Newton is at his lowest, incapacitated in bed, his wife destroys his laboratory, convinced that scientific endeavour is what is driving her husband to despair.

Like the satire of Pain and Alden, fiction invested in final ambiguities of this kind might be expected to look unfavourably on any ideology of final truth. This distrust of science is more overt in Crosthwaite than in any of the other pieces of writing I have yet discussed, and it is therefore fitting that it appears in *Longman's*, a magazine which, unlike the other monthlies I've been focussing on, remained unillustrated through the 1890s. '*Longman's* always looked old-

[61] Crosthwaite, p. 484.

fashioned and thus never represented what it offered', says one index, blaming the editors' resistance to change for the magazine's eventual collapse.[62] The most wholeheartedly conservative piece of writing discussed in this chapter carries no images of any kind.

Also unillustrated, and also sceptical of the psychological effects of experiments with visibility, was H. G. Wells's *The Invisible Man*. This novella was serialized in *Pearson's Weekly*, the precursor and sister-publication of the monthly *Pearson's Magazine*, from June to August 1897. The first instalment, then, appeared a year and a half after Röntgen's X-ray research first appeared in English. Griffin himself is explicit in denying that his research is related to Röntgen's, but the fact that he even has to make this denial, the appearance of the apparatus he uses, and the unnerving and profoundly visual consequences of his work, to say nothing of the timing of the novella's appearance, make the comparison a straightforward one.[63] It is, in fact, a comparison explicitly invited by a selection of celebrity vignettes on the same page as the novella's last instalment, in the issue for August 7th, which includes a paragraph on William Crookes: 'It was he […] who practically paved the way for the discovery of the Röntgen rays, for he came very near discovering them himself'.[64]

Griffin's mania is more disturbing than Newton's: rendered invisible to human eyes by his experiments on himself, he swiftly abandons his attempts to find a scientific 'cure' and embarks rather on a campaign of theft, terrorism, and finally murder. But as in the way Crosthwaite concludes his tale, there are moments of ambiguity, including a gap in the story at the point of the supreme crime, details of which are provided only as conjecture after the fact:

> If it is our supposition that the Invisible Man's refuge was the Hintondean thickets, then we must suppose that in the early afternoon he sallied out again, bent upon some project that involved the use of a weapon.[65]

The story is told a third-person narrator who often seems omniscient, but becomes on the whole less so as the novella continues (in parallel with Griffin,

[62] Ashley, *The Age of the Storytellers*, p. 258.
[63] For an overview of the X-rays in Wells's novella, see Grove, p. 169.
[64] 'You May See Them On Bank Holiday', *Pearson's Weekly*, 7 August 1897, p. 56.
[65] H. G. Wells, 'The Invisible Man: A Grotesque Romance', *Pearson's Weekly*, 31 July 1897, 41–42 (p. 41).

who becomes on the whole less and less a scientist). 'Our supposition' and 'we must suppose' in this passage attest to this gradual change. In the next sentence, the interposition of an unexpected 'me' makes us really wonder who is telling the story: 'the evidence that he had the iron rod in hand before he met Wicksteed is to me at least overwhelming' (p. 41).

This is one of many points at which the story appears to become a testimonial rather than omniscient fiction, but the narrator doesn't seem to be any of the characters named in the novel. Moments where a narrator seems personally manifest are also hard to reconcile with the prosaic language of some of the descriptive passages. This is, after all, a novel which starts with the decidedly omniscient-sounding sentence:

> The stranger came early in February, one wintry day, through a biting wind and a driving snow, the last snowfall of the year, over the down, walking, as it seemed, from Bramblehurst railway station, and carrying a little black portmanteau in his thickly gloved hand.[66]

Passages such as this one seem to come not from a character in the book but from the fantasy plane of objectivity inhabited by the narrators of much fiction. However, by the book's concluding moments ('There was, I am afraid, some savage kicking') we realise that this narrator is actually subjective; that there is a second 'invisible man' at the heart of the story, on display at all times, like the X-rays in the Sozodont advert or the magazine editor in the Villiers pictures, taken for granted, absolved from the necessity of actually appearing.[67] There are places where this mysterious voice seems reminiscent of a scientist – meticulously collecting the best data available and only coming to conclusions cautiously, with talk of 'evidence' – but there are more where it resembles that of a journalist. A specific kind of journalist who interviews bystanders, puts the pieces together, and is unafraid to add subjective embellishments (and images) to his relations, often passing them off – almost convincingly – as unbiased. A New Journalist.

[66] H. G. Wells, 'The Invisible Man: A Grotesque Romance', *Pearson's Weekly*, 12 June 1897, 777–78 (p. 777).
[67] H. G. Wells, 'The Invisible Man: A Grotesque Romance', *Pearson's Weekly*, 7 August 1897, 56 (p. 56).

VI. Paradoxes

The epilogue of 'The Invisible Man', which appeared only when the novella was published in book form, shows Mr Marvel, Griffin's unwilling assistant, attempting to learn the secret of invisibility. He has carefully concealed the notebooks containing the discovery from the authorities, and every night, in solitude, he examines them. The quest is a hopeless one – not only does Marvel lack the intellectual capacity to break the cipher in which the books were written, but some of the pages have themselves become irretrievably invisible, 'washed blank by dirty water'.[68] Science here is untranslatable: ravaged by material conditions, written in code legible only to its author. Unlike the novella's protean storyteller, Griffin is a deliberately recalcitrant narrator, full of secrets from the very beginning until long after his death, the only main character whose thoughts are inaccessible to the narrator. Even Griffin's name is not revealed until chapter seventeen. The drive apparently felt by every other character to find out about him, to render the invisible visible, befits the story's initial appearance in the New Journalist press, as does the shifting status of the narrator, who, despite forays into subjectivity, is still able to close with assured foreknowledge – 'none other will know of them until he [Marvel] dies' – and get away with it (p. 279). These words, with their omniscient access to both the future and to Marvel's private life, are impossible for a character in the world of the book. Wells is having his cake and eating it here, for thanks to the narrator's ambiguous position in the text, Marvel's secret is both assuredly safe forever and immediately and effectively communicated to every reader.

Basic though this may seem, it underscores some crucial points: New Journalist approaches to fact were evident in fiction as well as news reporting; they were often deeply concerned with visibility; and they were the product of a *variety* of images and voices.[69] Allen W. Grove's article 'Röntgen's Ghosts', to which I've had recourse throughout this chapter, maintains that the periodical press 'portrayed a skeptical, even paranoid public, grasping to understand the

[68] H. G. Wells, *The Invisible Man: A Grotesque Romance* (New York & London: Edward Arnold, 1897), p. 278.
[69] For some discussion of the Daily Mirror and 'the crucial link between journalism and pictures', see Joel H. Wiener, 'How New Was the New Journalism?', in *Papers for the Millions: The New Journalism in Britain, 1850s to 1914*, ed. by Joel H. Wiener (Westport, CT: Greenwood Press, 1988), pp. 47–71 (p. 52).

implications of the penetrative powers of these new rays', but I have tried to show a more diverse picture, albeit one in which scepticism was a strong theme.[70] Attitudes towards the X-rays were conflicted within individual publications and often even within individual articles and stories. Many shared Stead's sense of optimism, garnered from the feeling of being on the bleeding edge of a tremendous discovery which could be of enormous use in medicine and forensics. When voices were raised in fear, it was not necessarily fear about privacy, death-images and ghosts; it could be a deeper fear of precision, anxieties over objective truth. These anxieties are often manifest in a tendency to elide process: 'I am not, of course, able to give a precise and detailed account of the way in which it will be done'[71], says Damstruther, in Pain's piece. 'I am not going, however, to weary the reader with the details of my discovery. What I wish to tell is the effect and consequences of it', says Newton, in Crosthwaite's.[72]

Why, then, was objective truth such a source of anxiety for the New Journalist press? If the X-rays illuminated any one concern in the periodical press, it was, so to speak, the concern of there being only one concern. The Invisible Man is abhorrent because he wants to establish a Reign of Terror: 'He must take some town, like your Burdock, and terrify and dominate it'.[73] The fear is of one subjective voice becoming dominant, and it's understandable that such an anxiety was articulated in a press which thrived on so many different kinds and styles of writing. 'Mr. A', the medium with whom Glendinning developed his dorchagraphs, was himself sceptical of Spiritualism: 'I do not believe an objective reality can or has been presented to the plates'.[74] Objective reality is a distasteful idea to a media (or medium) so committed to pushing variety for the sake of entertainment; one which, to maximise profits, needs to appeal to as many different types of reader as possible, and which is working hard to create more.

When it didn't speak of 'X-rays' or 'Röntgen rays' (respectively, the name their modest discoverer gave them and the name he would never use), the magazines had another name for this fictive new technology. They called it 'The

[70] Grove, p. 143.
[71] Damstruther and Pain, p. 678.
[72] Crosthwaite, p. 471.
[73] H. G. Wells, 'The Invisible Man: A Grotesque Romance', *Pearson's Weekly*, 1897, 24 July 25–26 (p. 26).
[74] Stead, 'Psychic Pictures Without a Camera', p. 29.

New Photography'.[75] The term is a fitting one, for it not only shows the emphasis placed by the mass media on novelty but sets the discovery alongside Matthew Arnold's label for the mass media itself. Like the New Journalism, the New Photography was powered by enormous strides forward in technology; like the New Journalism, the New Photography was explicitly of its time and a site of frenzied cultural activity. It's unsurprising, therefore, that in the writing and images printed by the New Journalism, X-rays were used figuratively to do what printing was being used to do literally – draw disparate things together. '[O]ne of the most impressive accomplishments of such connective technologies', Aaron Worth has written, 'may have inhered in their power to bind together what seem to us hopelessly contradictory, even paradoxical ideologies': he was writing of communication technologies such as the telegraph, but X-rays too can be connective, bringing into contact the multifarious and paradoxical concerns of the New Journalist press.[76] 'The co-presence of these domains of knowledge', says James Mussell of a dispute in another 1890s periodical which incorporates astronomy, scripture, geography and philosophy, 'not only denies a single authoritative standpoint, but also ensures that a single author cannot authoritatively pronounce on an issue'.[77]

Of course, Röntgen's discovery was not primarily a cultural event. It was a genuine scientific breakthrough which widened human understanding of the universe, but to emphasise that would have been to run contrary to Stead's policy of believing anybody he deemed trustworthy. It would have been, against the wishes of Alden, to explore Antarctica. Science, once confirmed, delegitimises other voices – the voices from the borderland, the voices of fantasy and of the imagination. To do science justice, it is necessary to deny authority to a range of readers and writers on a scale which was at odds with the journalistic and commercial values of variety and entertainment held dear by the magazines. 'Science might contribute new spectacles', as Katy Price has written of the Harmsworth Press in a later period, 'but was itself subject to scrutiny'.[78] These publications needn't be considered antiscientific any more than Stead himself –

[75] *The Photogram* published a special issue called 'The New Light and the New Photography' in February 1896; the term recurs throughout the magazines, including in science publications such as *Nature*.
[76] Worth, p. 69.
[77] Mussell, *Science, Time and Space in the Late Nineteenth-Century Periodical Press*, p. 34.
[78] Price, p. 95.

science, exciting and new, was welcome – but they were reluctant to accord a higher truth-authority to science than to any other kind of discourse.

Though such openness was surely good for business, this was about more than purely the commercial value of mass appeal. Another thing for which the New Journalist publications are known, especially those under the auspices of Stead, is their passionate advocacy for democracy. Stead believed strongly that a free and responsible press should have a core and even a governing role in any democratic society.[79] One of the press's key roles, he suggests in an 1886 essay, should be to use technological mastery of facts to influence government policy for the better:

> Even now, with his imperfect knowledge of facts, the journalist wields enormous influence. What would he be if he had so perfected the mechanism of his craft as to be master of the facts – especially of the dominant fact of all, the state of public opinion?[80]

Stead's insistence on the ideal newspaper's final reliance on absolute access to the truth is significant. More so is the belief he espouses that the greatest of these truths isn't an objective truth at all, but the subjective fact of public opinion. It is worth comparing this quotation to one I have already cited above, from Stead's writing on the X-rays a decade later:

> The presentation of our bones, or the matter of our brain, or the action of the heart, by the 'X' rays would be far transcended in importance, if it were once established that we could procure a permanent record of our passing moods and fancies.[81]

The similarity between these two passages – calling respectively for a journalism and a science capable of providing access to current, interior truth – suggests that quantifying 'the public opinion' in the name of a truly representative democracy was the driving aim of all of Stead's various publications. In many of their activities, including, I suggest, their choice of subject-matter, a key emphasis was on an equality of voice, an equality of right to newsworthiness: 'No one is too

[79] For a thorough discussion of Stead's investigative journalism in this regard, see Ray Boston, 'W. T. Stead and Democracy by Journalism', in *Papers for the Millions: The New Journalism in Britain, 1850s to 1914*, ed. by Joel H. Wiener (Westport, CT: Greenwood Press, 1988), pp. 91–106.
[80] Stead, 'Future of Journalism', p. 664.
[81] Stead, ed., 'Psychic Photography', p. 317.

exalted to be interviewed', Stead maintained, 'no one too humble'.[82] My contention is that science's special claims on truth are at the heart of its conflicted relationship with the media, a relationship far too involved to be expressed in terms simply of 'pro' or 'anti' science. Perhaps, then, it was their vagueness rather than their newness which really made X-rays appealing – the fact that, still so poorly understood by science in those first years, they remained so open to the interpretation of 'public opinion'.

So far in this thesis, I have been presenting the polyphony of the *fin de siècle* periodical press, and its accompanying vagueness, as roundly beneficial. The elasticity of the boundaries between categories in these magazines provides us with a glimpse of a world before extreme specialisation, when different kinds of knowledge and art were freer to cross-fertilise each other and where, consequentially, far less energy was wasted on fighting. This position, however, has now run into a serious difficulty. How can one simultaneously declare that a strength of the press was its democratic nebulousness when that nebulousness is inevitably responsible for the press's misrepresentation of science, and its demotion of the objective truth which science has at its heart?

This is a key question and, in attempting to answer it, it is useful to start by noting – as I did in the introduction – that holding 'hopelessly contradictory, even paradoxical ideologies' together is certainly something that New Journalism can teach us more about. Roger Luckhurst points out that it was Stead's enthusiasm for connections which was behind the breadth of his activities, and implicitly invites us to recapture a wider sense of the late-Victorian period by retracing those connections ourselves:

> Stead's apparently diverse interests in mass democracy, spirits and phantasms, an Empire-wide penny post, telepathy, imperial federation, new technology, astral travel, and popular science were the result less of individual foible than of a wider *episteme*, a network of knowledges in which forms of the occult promised to make revelatory connections across the territory of late Victorian modernity, rather than a consolatory exit from it.[83]

[82] W. T. Stead, 'Government by Journalism', *Contemporary Review*, 49 (May 1886), 653–74 (p. 669).
[83] Luckhurst, 'W. T. Stead's Occult Economies', p. 125. Original emphasis.

These words can serve as a reminder that the diaspora represented by the magazines was to some degree a cohesive one. Indeed, the function of the magazines, some of them wildly different from each other in terms of political stance and editorial philosophy, was arguably to render it so. In this chapter I've mentioned periodicals as diverse as *Nature*, *The Idler* and *Borderland* – publications with obvious and even fundamental differences – but by pointing out their various engagements with X-rays I hope I've shown that there is something to be said for considering these publications in light of their similarities, too. All jostled for attention in the same commercial space, faced the same material and financial demands – in short, existed in the same society. Luckhurst's passage emphasises the value of stressing connections, rather than differences, when attempting to come to terms with that society.

Nevertheless, the realisation that science and fiction could have detrimental as well as supportive effects when closely entangled in print is an important one. It does not reaffirm the conception of a two-culture division, for the simultaneous existence of positive and negative connections is further testimony to the complexity of their relationship, a complexity for which I have been arguing throughout. But apprehending the magazines' shortcomings in conveying *fin de siècle* science is important because our present-day mass media is very much their descendant. As the inheritors of Stead, Newnes, Harmsworth and Pearson, we still have a press that prefers individual anecdotes to statistics; a press which will both favour and provide narrative over facts; a press obsessed with celebrity gossip; a press whose approach to science is generally enthusiastic but seldom rigorous; a press which operates in time cycles with which science is often incompatible; a press which sees 'truth' as the midpoint of the two most extreme views; a press committed to the freedom of its own multiplicity of voices over and above the accuracy of any individual story. A press which, despite all of this, still manages to idealise objectivity, and convince people that it practices it. In June 2011, the *Independent* columnist Johann Hari was censured by his peers, by the public, and, eventually, by himself, when it came to light that he had, more than once, replaced the words said to him in interviews with equivalent passages from the interviewees' books. His defence was that by enhancing clarity, he was delivering a more important, less literal truth to his readers: 'I only ever substituted clearer expressions of the same sentiment, so the

reader knew what the subject thinks in the most comprehensible possible words'.[84] Replying on his *Telegraph* blog, Brendan O'Neill was unequivocal: 'The notion that one can reach 'the truth' by manipulating reality should be anathema to anyone who calls himself a journalist'.[85] This chapter has shown not only the naivety of both of these viewpoints, but also that despite O'Neill's professed shock, there is nothing new about the conversation between them.

*

The varied attitudes towards X-rays documented here show that it is certainly possible to find examples of a classic opposition between science and fiction. Taking this opposition as a given, however, requires us to ignore numerous positive and ambivalent accounts of the X-rays; examples of science and fiction working together. The contradictory messages sent out by the press, which, I have argued here, lend to it a kind of unity, may ultimately be to the disadvantage of science, which requires there to be one correct explanation of the world – but this is a very different proposition from that of a straightforward barrier between narrative and science. In understanding this, we come closer to understanding the troubled relationship between science and the present-day mass media. The next, final, chapter takes these arguments for complexity into a sphere in which they are at their most engaged with politics, examining periodical treatments of imperial exploration and proposing that science and fiction, even when apparently in conflict, are anything other than opposites before the power discourses of empire.

[84] Johann Hari, 'My Journalism Is at the Centre of a Storm. This Is What I Have Learned.', *The Independent*, 2011 <http://www.independent.co.uk/opinion/commentators/johann-hari/johann-hari-my-journalism-is-at-the-centre-of-a-storm-this-is-what-i-have-learned-2304199.html> [accessed 3 July 2011].
[85] Brendan O'Neill, 'Johann Hari and the Tyranny of the "Good Lie"', *The Telegraph Blogs*, 2011 <http://blogs.telegraph.co.uk/news/brendanoneill2/100094506/johann-hari-and-the-tyranny-of-the-good-lie/> [accessed 3 July 2011].

Chapter Four: Further Northward

I. Of Nansen and Sherlock Holmes

Fridtjof Nansen left Christiania on the 24th of June, 1893 aboard *Fram*, a custom-built ship constructed to withstand being frozen into polar ice. Nansen (Fig 4.1) was already famous as the leader of the first expedition to have crossed the interior of Greenland in 1888, but his objective this time was bolder still: to travel into the heart of the Arctic, perhaps becoming the first person to reach the North Pole.

Nansen's voyage, and its prospects, generated an enormous amount of interest in London, and the periodicals were full of speculation, some of it less than optimistic. '[U]nless Dr. Nansen wishes to commit suicide, he had better remain at home', said General Greeley. He was quoted in a *Review of Reviews* article which called Nansen 'young [and] comparatively inexperienced' but also said that he was 'very courageous' and praised him for his intention 'to put his theory to the test of experience'.[1]

The theory referred to here was explained by Nansen to the British public in a lavishly-illustrated article written for the *Strand* magazine when *Fram* was already underway. He dispatched the copy to London from the Barents Sea 'just before he and his brave companions disappeared, for years, into the unknown

[1] [Stead], '"How I Shall Start for the North Pole" by Dr. Nansen', *Review of Reviews*, 4 (September 1891), 265 (p. 265).

regions of eternal ice'.[2] The piece opens with a straightforward synopsis of Nansen's central hypothesis:

> [T]here must somewhere run currents into the Polar region which carry the floe-ice across the Polar Sea, first northward towards the Pole, and then southward again into the Atlantic Ocean. […] I shall try to find the place where the heart of this current has its origin, and shall go north there until I am beset in the Polar ice, and then simply let the current have its way, and let it carry us across the unknown region and out into the open sea again on this side of the Pole.[3]

Previous attempts at the Pole had started from the Western hemisphere, making slow progress northward because of the constant resistance of the Arctic currents. Nansen's idea that these currents originated from the other side, and could effectively be 'ridden' to the Pole if approached from the right direction, seemed to him a 'very simple conclusion', but not everyone was convinced (p. 614). For some members of the Royal Geographical Society, the idea of deliberately freezing a ship into an iceberg and allowing it to drift at the mercy of the ocean (Fig. 4.2) was self-destructive folly. For Nansen, it was merely slightly dull: 'If we drift many years in this way the life may become somewhat monotonous, but we shall have plenty of things to do to pass the time' (p. 620).

Public interest in Nansen's voyage was enormous. In spite of the sceptical voices at the RGS, the British reading public keenly consumed a myriad of articles, interviews and stories inspired by the Norwegian expedition. There were lots of reasons for his appeal, not least Nansen's powerful character, good looks and the earnestness with which he embodied the ideals of exploration (about the latter, more below). As significant, though, was the breadth of his expertise. A neurologist and zoologist as well as a regarded sportsman and hunter, he had the brains to conjure up the voyage as well as the bravado and tenacity to complete it successfully. 'In an age beginning to glimpse the approaching domination of the specialist', remarks his biographer, 'he personified the universal man'.[4] He was

[2] Editorial note in Fridtjof Nansen, 'Towards the North Pole', *Strand Magazine*, 6 (December 1893), 614–24 (p. 614).
[3] Nansen, 'Towards the North Pole', pp. 614 & 615.
[4] Roland Huntford, 'Introduction', in *Farthest North* (London: Duckworth, 2000), p. xi.

also ‘a creation of the press’, and perhaps, given the broad readership of the monthlies, the two things are not unrelated.[5]

Nansen’s farewell to civilisation appeared in the *Strand* in December 1893, in the very same issue in which another ‘universal man’ - Sherlock Holmes - vanished into the wilderness for many years. ‘The Adventure of the Final Problem’ finds Holmes battling the evil Professor Moriarty atop the Riechenbach falls, both plunging to their apparent deaths. The *Strand*’s publication of this story marks the beginning of the period known by Holmes aficionados as ‘The Great Hiatus’, a decade during which Arthur Conan Doyle resisted an enormous amount of public pressure to bring his detective hero back to life, finally capitulating in October 1903 (*The Hound of the Baskervilles*, serialised in 1901, was set prior to Holmes’s death). Seen with the benefit of hindsight, Holmes and Nansen go well together in this issue of the *Strand*. Not only are both characters going beyond the reach of the magazine’s readership, but each pens his own farewell with conviction, flair and grace under pressure. ‘[M]y career had in any case reached its crisis, and […] no possible conclusion to it could be more congenial to me than this’, writes Holmes of his imminent fight-to-the-death,[6] while Nansen reacts to the possibility of the destruction of *Fram* by suggesting offhandedly that he and his crew can live quite comfortably on the lifeboats: ‘And in case the big boats should also be lost, we can build snow-huts on the ice’.[7] Both heroes, of course, are also men of science: ‘There is much scientific work to be done in these unknown regions’, says Nansen (p. 620); ‘Of late’, muses Holmes, summing up his career, ‘I have been tempted to look into the problems furnished by Nature rather than those more superficial ones for which our artificial state of society is responsible’.[8] In the story in which Holmes miraculously returned to life in 1903, he reveals that one of his aliases whilst ‘dead’ was a Norwegian explorer, Sigerson. The reference is glancing, and nothing suggests that Conan Doyle is thinking of Nansen explicitly, for Holmes explores Tibet, not the Arctic.[9] However, given their proximity in the periodical

[5] Huntford, p. ix. For the ‘universal man’ and the press idea, see section four of chapter 1, above.
[6] Arthur Conan Doyle, ‘The Adventure of the Final Problem’, *Strand Magazine*, 6 (December 1893), 558–70 (p. 570).
[7] Nansen, ‘Towards the North Pole’, p. 622.
[8] Conan Doyle, ‘Final Problem’, p. 567.
[9] Another convincing suggestion is that the model for Sigerson was another Norweigan, Sven Hedin. Qtd. in Arthur Conan Doyle, *The New Annotated Sherlock Holmes*, ed. by Leslie S. Klinger, iii vols. (New York, NY: W. W. Norton, 2005), p. 796. Note that this is unreferenced

press (in which Sigerson also implicitly makes an appearance, Holmes able to assume that Watson 'may have read' of his adventures)[10], this is at least a gratifying coincidence. It may be more than that, because Conan Doyle was extremely interested in the Arctic sea, had been there himself aboard a whaler in 1880, and wrote several articles on the subject, including one published in the *Strand* itself in January 1897, shortly after Nansen returned to civilisation.

This chapter will return to Conan Doyle presently. For the moment, it is sufficient to note that certain themes detectable in reporting on Nansen's departure can be traced in both factual and fictitious narratives. 'No explorer since Franklin has gained so great a hold upon the imagination of his contemporaries', wrote J. Arthur Bain in the *Strand*.[11] Even with the aid of cameras, which he took with him in large numbers, Nansen is unable to describe the extraordinary landscapes of the polar seas without recourse to imaginative language:

> To give those who have not seen this world of ice an idea of what it looks like is not easy, as it is so different from anything else. It is a strange thing with this region, that when you are there, you think it sometimes monotonous perhaps ; but when you are away from it, you long to get back again to its white, vast solitude.[12]

Considered in light of this kind of language, it is perhaps unsurprising that polar landscapes had been explored by science fiction writers as well as by governments and pioneers. Jules Verne's Captain Nemo had placed 'a black flag bearing a gold 'N'' on the South Pole in 1868, whilst Edgar Allan Poe's only novel, *Arthur Gordon Pym of Nantucket* (1838), attains most of its science fiction qualifications in its cryptic closing pages set amidst the Antarctic ice. Most pertinent of all, Mary Shelley's *Frankenstein* (1818) is set against the backdrop of Robert Walton's (fictitious) voyage to the North Pole, the failure of which provides an apposite keynote for Victor's story.

Frankenstein opens with Walton's hope that he may find at the Pole 'a land surpassing in wonders and in beauty every region hitherto discovered on the

'Sherlockian' scholarship and should be treated with caution.

[10] Arthur Conan Doyle, 'The Adventure of the Empty House', *Strand Magazine*, 26 (October 1903), 363–76 (p. 368).

[11] J. Arthur Bain, 'A Talk with Dr. Nansen', *Strand Magazine*, 12 (December 1896), 693–702 (p. 695).

[12] Nansen, 'Towards the North Pole', p. 623.

habitable globe', and it's the possibilities of this new land which 'are sufficient to conquer all fear of danger or death and to induce [him] to commence this laborious voyage'.[13] Here, on the first page of a book about internal truth-discoveries, about the soul of man, a crucial link is formed with exterior voyages of exploration. These voyages and the promise of 'strange new worlds' at the end of them are routine fascinations of sf. Before the map of Earth was filled in, the new worlds could be islands across the ocean (as in Thomas More's *Utopia* and its descendents); as real exploration persisted, they were pushed up to the Poles, and eventually displaced from the surface of the planet entirely, finding their home among the stars (a transition sketched in more detail in section 7, below). The quest for discovery is generally seen as one of the nobler goals of both science fiction and its protagonists. But just as the supposedly curiosity-driven researches of Victor Frankenstein have their dark side, it is, of course, difficult to consider either real-life voyages of exploration or their fictional counterparts entirely altruistic, even and perhaps especially when they seem motivated solely by the spirit of scientific discovery. Nansen tells his readers at one point '[I]t is to explore that we go out', but elsewhere he closes a paragraph about electric power with the phrase '[i]n this way man must conquer Nature'.[14] In these narratives, exploration and conquest are never too far removed from each other. The purpose of this chapter is to explore that relationship, and the role played in both articulating and developing it by periodical sf in the *fin de siècle*.

In what follows, I examine a range of items of both sf and non-fiction which engaged with polar exploration during the time Nansen was away (1893-6), and in the years following his return. As in the preceding chapters, I highlight areas in which science and fiction appear to be supporting each other rather than functioning in opposition. This time, however, they are united in the service of an explicitly imperialist agenda: I draw in particular on material from strongly pro-imperial publications such as the *Strand* and *Pearson's Magazine*. My objective here is threefold: I want to show that both fact and fiction can be equally complicit in the imperial project (that their use together, rather than as opposites, remains politically subjective); I want to argue that an obfuscatory approach to the location of final truth is a characteristic means by which this linkage is

[13] Mary Shelley, *Frankenstein*, ed. by Marilyn Butler (Oxford: Oxford University Press, 1994), pp. 5 & 6.
[14] Nansen, 'Towards the North Pole', pp. 623 & 621.

affected; and I want to demonstrate that the emergent genre of sf was so thoroughly entangled in this conversation that it is no wonder it has been struggling to leave it ever since (and may not have succeeded). The polar regions turn out to be an excellent place to observe these things in action, since they represent an unexplored territory (a blank on the map) which was nevertheless within the grasp of empire in the *fin de siècle*. A provably real place, it was nevertheless – for a few more years – also a flourishing-ground for the imagination.

Most of this chapter focuses on different imperial aspects of fictitious treatments of polar exploration, returning frequently to magazine coverage of Nansen's real-life expedition for comparison. I start, in section 2, by tracing further the close relationship between sf and non-fiction written about the Pole, drawing attention to the tangle of fact and fiction which almost inevitably surrounds tales of exploration. In section 3 I demonstrate that these stories retain a colonial interest in race; section 4 argues that the Pole also represents a potent *symbolic* target for imperial expansion; and section 5 focuses on the more prosaic aspects of empire in the form of trade and commodity culture. Section 6 unites the arguments of the previous three sections with my current point about the Arctic's factual ambiguity, concluding the running argument that science, fiction, imperialism, and polar exploration are all inextricably bound together in the magazines by vagueness – the vagueness documented at the end of chapter 3 is here seen performing even more explicitly political work. I take these conclusions further in two final sections: section 7 tracks sf's departure from the planet, arguing that tales of space exploration take imperial baggage with them from their terrestrial analogues which cannot be lightly shrugged off; section 8 argues that an imperial ideology, characterised in particular by its use of anticlimax, continues to drive human expansion into space today.

In general, I focus on source material discussing the Arctic, although the Antarctic inevitably comes into the conversation as well. Sarah Moss has argued in *Scott's Last Biscuit* that 'Antarctica can be less problematically assimilated into a quest narrative because no-one has ever lived there', but this chapter (in particular section 3) contends that even with no real people, the assimilation, both real and imagined, of a space like the polar regions is far from

unproblematic. Indeed, it was for the purposes of the non-existent natives that W. L. Alden jokingly proposed in 1896 that Antarctic exploration be stopped:

> …there is still room in the vast and unknown Antarctic continent for all sorts of cities and men. The people who understand the art of flying; who use gold for the most common domestic purposes; who have domesticated most of the animals that are extinct in the other parts of the globe; who receive all strangers […] as messengers direct from the gods; are still dwelling and thriving close to the South Pole.
> Of course, they will not be seen by any members of the Antarctic expedition, and after the expedition has made its report they will vanish for ever, just as the wonderful white Africans have vanished. Cannot science keep its hands from this one comparatively small part of the globe, and leave it to the romancer[?][15]

Alden's sentiments here sound all the keynotes of this chapter: the relationships between fantasy and reality, the connections they both have with the British imperial project as expressed in the periodicals, and the powerful sense of anticlimax, the increasingly-impossible challenge, the desire to press ever onwards into the unknown. This understanding of empire is also central to the general ideas behind this thesis, mapping directly on to the more esoteric territorial claims of disciplinary and generic discourses on which I have focussed throughout. In the meantime, by examining the ways in which the unexplored areas of the planet were used as imaginative spaces, this chapter draws attention to the role which both science and fiction have played in the project of the British Empire,[16] presenting empirical discovery and imperial conquest as inseparable and arguing throughout that few explorers have set out to new lands without wishing to raise a flag on them, saying, as Nemo does, 'I hereby claim this entire part of the globe'.[17]

[15] Alden, 'Wisdom Let Loose' (May 1896), pp. 525–26.
[16] I have made similar arguments to these, with different evidence, in '"We are Explorers": Science Fiction's Colonial Heritage' (unpublished undergraduate dissertation, University of Exeter, 2007).
[17] Jules Verne, *Twenty Thousand Leagues Under the Seas*, trans. by William Butcher (Oxford: Oxford University Press, 1998), p. 312.

II. Balloons to the Arctic

'The North Pole', says a character in George Griffith's short story 'From Pole to Pole' (*Windsor Magazine*, October 1904), 'although still undiscovered, is getting a little bit hackneyed'.[18] The voyages of Nansen and his fellow explorers had by this time given rise to a crop of stories which dealt with the possibilities of Earth's remotest places. In part, this was because explorers became increasingly publicity-conscious: 'In the very polar-bear's hug of circumstance they remember their cameras', commented Richard Le Gallienne in 1897.[19] Another possible cause was that the expeditions were by necessity out of communication with the world of print culture for several years (Nansen was away for just over three). As the expeditions attempted to fill in the maps of the polar regions, speculative fiction filled in the temporal gaps in the publication cycle when new information about the Arctic was unavailable.

In consequence, these works of fiction can be used to illustrate the press's dependence on a network of connections to reality. Through his concept of 'circulating reference', Bruno Latour argues that ordering the wilderness is possible for science only when it preserves a retraceable chain of links between published findings and the objects of study in their chaotic, outdoor environment.[20] The example he gives is of a part of the Amazon jungle being studied by scientists, but I want to suggest that this model can work for fiction as well; that the strongest fiction is the most connected, and that these connections can take the form of translations (into fantasy, into surrealism) as long as there is a retraceable chain of reference. One story which demonstrates the possibilities of this kind of reading is John Munro's 'How I Discovered the North Pole', published in *Cassell's Magazine* in June 1894, a little under a year after Nansen's departure. In this section I argue that this story's close relationship with real-life polar exploration, strengthened by its appearance in a periodical, is paradigmatic of the relationship between fact and fantasy which exists in an enormous amount of exploration literature, from the moon hoax of Edgar Allan Poe to the media coverage of the Apollo landings.

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[18] George Griffith, 'From Pole to Pole', *Windsor Magazine*, 20 (October 1904), 531–44 (p. 533).
[19] Richard Le Gallienne, 'Wanderings in Bookland', *The Idler*, 11 (April 1897), 403–07 (p. 404).
[20] For 'circulating reference', see Latour, *Pandora's Hope*, chap. 2.

The narrator of 'How I Discovered the North Pole' releases a series of hot-air balloons, each equipped with automatic cameras, in the hopes that they will drift over the Pole and return with photographs of it. Munro's reputation as an author was founded on a number of popular non-fictional works about electricity, but he also wrote several tales which may safely be described as sf, and would soon publish the novel *A Trip To Venus* (1897). The byline of his story in *Cassell's* is suggestive, for in addition to containing a dedication to Jules Verne it bills Munro as 'AUTHOR OF 'THE ROMANCE OF ELECTRICITY''.[21] The title of Munro's previous work, as well as the decision to use it as advertising here (stressing his non-fictional credentials alongside his admiration for Verne), is indicative of the equal weighting accorded to fact and fantasy throughout the piece.

Munro is plainly writing in an attempt to be absolutely convincing, so much so that a present-day reader is compelled to check quite carefully that the events he describes didn't actually take place. Some of them, in fact, did – the story opens with a discussion of the last British attempt at the North Pole, commanded by George Nares in 1875-6, and the next page and a half of the tale is a synopsis of some of the other proposed methods for reaching it, including a fairly lengthy summary of Nansen's plans. The unnamed narrator is in the audience at the Norwegian's presentation to the RGS, and, inspired by the talk, he sits down at home to think the matter over 'with one of Nansen's maps' (p. 484). There follows some speculation about the possibility of running electric cables out behind sledges to provide expeditions with 'heat, light and even motive power' before Munro goes further, saying:

> A submarine vessel *à la* Jules Verne might, indeed, be constructed, and supposing the surface at the Pole to be frozen hard, it might be possible to blast the ice with dynamite, and allow the vessel to emerge from the water.
>
> Again, a steering balloon with a closed and heated car, or a flying machine, were possible means of journeying through the air.[22]

[21] J. Munro, 'How I Discovered the North Pole', *Cassell's Magazine*, 20 (June 1894), 483–89 (p. 483).
[22] Munro, p. 484.

Even without the Verne reference (the second in the piece) the techno-fetishist overtones of this final sentence are obvious. Through Munro's opening, the transitions between the historical account of British Polar exploration, the survey of Nansen's plan and the futurist science-fictional speculations are seamless, and the whole process takes less than two pages. Munro then rejects the Verne-like methods of transport, saying that '[s]uch conveyances […] belonged to the future' and arrives at the conclusion that 'an automatic explorer in the shape of a balloon' can adequately explore the Pole for us in the meantime (p. 484). We don't need to actually go to the Pole, Munro suggests, if we just attach some cameras with a clockwork timers to balloons and release them in the Arctic sea when the wind is blowing in the right direction. Although it might be said to prefigure the idea of the space probe, this seems a fairly modest novum for a work of sf – but perhaps that modesty is the point. By keeping its distance from the more outrageous technological fantasies in this fashion, Munro's story maintains plausibility throughout its extensive descriptions of the way in which the balloon is put together: in places, the only real clue that the whole narrative is speculative is in the fact that the accompanying illustrations are drawings rather than photographs (without commenting on the illustrations directly, the piece promises that photographs will eventually follow in a forthcoming book[23]). The narrator's lack of name also adds plausibility, since it makes it easier for the reader to assume that Munro is writing as himself, a man known as a practitioner and communicator of real science.

Munro's relentless desire to furnish us with a believable narrative is evident in the precision with which he describes the route of his voyage to the Arctic seas, the vividness with which he relates apparently trivial details of the journey, and his provision of coordinates for the release of each balloon. A typical sentence from the middle of the tale:

> There was drift-ice between us and the Seven Islands, but not enough to prevent us forcing a passage to the north end of Parry's Island, where we anchored in lat. 80° 40' N., long. 21° E.[24]

[23] 'A full account of the expedition will be given in a book which I am about to publish, including the narrative of our adventures, fac-similies of the photographs, and the scientific observations' (p. 489).
[24] Munro, p. 486.

The most significant appearance of 'real detail' in the story, though, comes on the last page, when one of the narrator's explorer-balloons is finally retrieved and its cargo of negatives developed:

> In the middle of the white waste of ice it showed a dark blotch, not unlike a ship, with black spots here and there, which I took to be men. On enlarging it, judge of my astonishment to find that it was indeed a vessel caught in the pack, and that in one of the dim figures on deck I fancied I could trace the features of Dr. Nansen, watching the balloon with a telescope to his eye![25]

This is, in a sense, the denouement of the story, since the photos of the Pole itself are 'somewhat blurred and out of focus', and the narrator neglects to describe them. Nansen's cameo is, internally, proof of the success of the balloon scheme; externally, it speaks of the need to fill the gap in the magazine press left by his disappearance into the ice. It is particularly well placed to do this given its periodical appearance: its publication in *Cassell's* allows Munro's story to connect repeatedly and explicitly with this extremely current event. When the original audience of this tale read about the photograph of Nansen trapped in the ice, that is where he actually was at that moment. 'Especially when over-wintering, explorers of the frozen regions essentially lost touch with the rhythm of daily Victorian life', write Deirdre C. and David H. Stam; Munro's story constructs a way for Nansen to continue to be part of the circuit of periodicals, just as the production of a small magazine aboard *Fram* during her long voyage (*Framjee*) fantasised a similar connection from Nansen's side.[26] Had the climax of Munro's tale been a picture of the Pole itself, it would in a sense have been less satisfying because more clearly fictitious. It's in this respect that Latour's model of circulating reference is most closely followed, and in adapting it to work for fiction as well as science, all I am really suggesting is that stronger fiction is better connected to this network of real events; that fact and fiction are not opposites (as, for Latour, maps and real terrain are not opposites) but rather

[25] Munro, p. 489.
[26] David H. Stam and Deirdre C. Stam, 'Bending Time: The Function of Periodicals in Nineteenth-Century Polar Naval Expeditions', *Victorian Periodicals Review*, 41 (2008), 301–22 (pp. 302 & 321). Stam and Stam provide an account of the numerous periodical practices taken by polar explorers cut off from the circuit of periodicals.

that fiction is (or at least has the capacity to be) a form of interpretation which is more successful when the steps in the chain of translation are retraceable.

By using Nansen instead of the Pole, Munro provides a fantasy for the age of the telegraph – instant news from the wilderness – as well as the more straightforward fantasy of Arctic exploration. His story is dependent for its effect on association with an immediate historical context, but also serves that context by buoying up public interest in Nansen when he is unable to speak for himself. As Nansen's biographer, Roland Huntford, comments, in the era before radio:

> …isolation descended once the shore had disappeared astern. Conversely, when voyagers vanished out of sight, they were swallowed by oblivion.[27]

Munro uses fiction to bridge this unbridgeable gap, restoring Nansen to the circuit of the periodical press from which he has been cut off. Uninterested, like the material I dealt with in chapter 2, in the Verne-esque inventions of the'future', Munro provides us instead with a vision of an ultimate, simultaneous present.

Two years after the publication of 'How I Discovered the North Pole' in *Cassell's*, the *Strand* published a piece which further complicates Munro's relationship with reality. This was 'Mr. Andrée's Balloon Voyage to the North Pole', a non-fiction article by Alfred T. Story. S. A. Andrée was a Swedish aeronaut and scientist who became convinced that he and his two companions (including Nils Strindberg, brother of August) could reach the Pole in a balloon. The three made meticulous preparations and departed after giving an interview to Story. At fifteen pages, lavishly illustrated with photographs, drawings, maps and diagrams, the piece is unusually long for the *Strand*, and it was also the only article advertised on the front cover of that month's issue. Nansen had now been absent for exactly three years, and the public was so far entirely ignorant as to whether he was dead or alive, successful or a failure. Other expeditions were beginning to capture the limelight.

In fact, Nansen's would return to civilisation the next month, with all hands alive and well. It was Andrée's which was doomed to end tragically, with

[27] Huntford, p. viii.

the deaths of all three adventurers.[28] Perhaps the idea of attempting to balloon to the Pole seems more foolhardy to us than Nansen's plan to sit comfortably in his boat, but Story's piece resounds with the same optimism which Nansen had himself deployed when announcing his own undertaking:

> Every attempt to do something that has not been done before looks foolhardy to most people, until the reasons upon which the adventurer acts are justified by results.[29]

Again there is the sense of a theory being put to the test; again the sense of detailed plans being comprehensively worked out; of physical endurance and scientific method united to do the unthinkable. Story's relation of Andrée's voyage shares all of these qualities with Nansen's earlier piece, but also with Munro's fiction. There are other similarities with Munro: not only do both schemes revolve around balloons, and not only do both dwell at length on nuances of construction and design rather than being urged forward by narrative, but there the schemes themselves have details in common. Most striking of these is that both rely on the possibility of local help for their success, and both propose to use pamphlets to help them access it. Munro explains:

> In order to trace and recover the balloon, I appended an automatic distributor of cards or circulars, bearing instructions in different languages […]. Ejected at regular intervals from the receptacle, these notices fluttered down to the earth, and the finder, reading the inscription, was asked to state in the blank space provided when and where he had picked it up […]. If he had found the balloon itself, he was requested to give particulars of the fact, and to preserve it carefully…[30]

Story's piece ends with a description of a similar scheme which Andrée actually put into place (Fig. 4.3):

> Tens of thousands of a circular, of which we give a photographic reproduction, have been distributed broadcast throughout Siberia, instructing all and sundry what to do should the balloon descend

[28] For an account of the Andrée expedition, and of ballooning generally, see L. T. C. Rolt, *The Aeronauts: A History of Ballooning 1783-1903* (London: Longmans, 1966).
[29] Alfred T. Story, 'Mr. Andrée's Balloon Voyage to the North Pole', *Strand Magazine*, 12 (July 1896), 77–91 (p. 77).
[30] Munro, p. 486.

> in their midst. Similar circulars have been distributed also in Alaska and British North America.[31]

As usual, I'm far from arguing a direct correspondence between Andrée and Munro – that the former read the latter, or that the latter was in any sense 'prophetic' of the former. The common traits of these two pieces, as reported by the magazines, say much more useful things about the press itself than they say about their authors. Story comes not only after Munro but after numerous other nineteenth-century tales in which balloon travel was the best method of reaching fantastic lands. The hero of Edgar Allan Poe's 'The Unparalleled Adventure of One Hans Pfaall' (*Southern Literary Messenger*, June 1835) gets all the way to the moon in one. There are also resonances in the other direction, into twentieth-century space travel – three men in a capsule, flying on instruments through the unknown towards a seemingly impossible goal. Andrée's balloon was the *Ornen*, in English the *Eagle*, the same name as Apollo 11's lunar module.

The Apollo programme, Andrée's doomed voyage, Hans Pfaall and J. Munro may seem a disparate lot at first, but one thing uniting them is the fact that they all made a considerable impression on the media culture of their time. Poe's tale was written for a Virginia monthly; the *Strand* and *Cassell's* were amongst the bestselling London magazines of their day; and the worldwide media sensation which surrounded the moon landings requires no expansion here. The four share another trait, though: a complex relationship with fact. *Hans Pfaall* was written as a hoax. Munro's tale doesn't set out to deceive, acknowledging up-front its indebtedness to Jules Verne, but is still, as demonstrated above, keen to appear absolutely believable. Andrée's real-life voyage, meticulously planned by scientists, has precedents in the balloon-voyage narratives of science fiction. And today, paradoxers convinced that the Apollo landings are works of carefully-constructed fiction continue to thrive.[32] Both *Hans Pfaall* and Apollo 11 reflect, or cause to be reflected, an underlying consumer interest in exploration which stretches far beyond the confines of material discoveries and will happily improvise when none are available. This interest often shows itself through presences and absences in periodical culture:

[31] Story, 'Mr. Andrée's Balloon Voyage', p. 91.
[32] For a summary of the Moon Landing 'Hoax', see for eg. 'Appalled at Apollo' in Philip Plait's *Bad Astronomy: Misconceptions and Misuses Revealed, from Astrology to the Moon Landing 'Hoax'* (New York, NY: John Wiley & Sons, 2002) pp.155-73.

Munro's tale, Story's article and even Andrée's expedition are in the magazines of 1894 and 1896 at least partly because Nansen can't be. It's also possible to see in these connections a hint of sf's representation of the Arctic as a sort of alien world, and lunar exploration is a subject to which this chapter will return in section 7. First, though, it is time to consider why the publics consuming this smorgasbord of fact and fiction were so invested in the discovery of new places.

III. Races to the Pole

The first words of 'How I Discovered the North Pole', taken from the title of a picture which inspires the narrator to set about inventing his balloons, are 'It can be done, and England ought to do it!'[33] The phrase recurs at intervals throughout the story, appearing on the lips of the narrator when he sits in his study drawing up his plans, and again when he is on the verge of releasing the first balloon from the deck of his ship. Its recurrence is suggestive of Munro's real motivations in writing the story, which are patriotic rather than scientific: 'Why should there not be a generous rivalry amongst nations, as amongst individuals, making them compete for renown?', asks the narrator (p. 489). His main concern on the story's first page is that the latitude record set by the Markham, a British Lieutenant on the Nares expedition, has been broken. Britain no longer leads the world in polar exploration:

> Of several attempts to reach the Pole by all three avenues into the Arctic Basin, that of Lieutenant Greeley, by way of Smith's Sound, has planted the Stars and Stripes in a higher latitude than 'Markham's Farthest.'[34]

Munro's story is captivating not just because it represents a technologically-empowered new offensive on Arctic exploration but because it's a distinctly British one, at a time when no real British missions were in the offing. 'Britain has been content […] to look on while other nations tried their hands', rues the narrator at the outset (p. 483). By the end of the tale, the prospect of his 'forthcoming book' promises not only data about the North Pole but a reaffirmation of British design, ingenuity and pluck. Knowing that even if the government did decide to bankroll another expedition, it could never catch up with Nansen – already absent a year – Munro creates a narrative in which Nansen not only features but is also, in a sense, beaten. Mute in the story, trapped in the ice, the Norwegian explorer can only watch, 'telescope to his eye', as Munro's balloon overtakes him (p. 489). The photo of this episode which the balloon brings back is not just engagement with a contemporary phenomenon; it is also the *coup de grace* in the fantasy of superseding it.

[33] Munro, p. 483.
[34] Munro, p. 489.

In this sense, the story prefigures the race for the South Pole which was to take place between Roald Amundsen and Robert Falcon Scott in 1911. But Western Imperialism manifests itself not just through gentlemanly rivalry (or outright war) between neighbouring powers – it also has built into it the assumption of European superiority. One of the most poignant expressions of simultaneity in 'How I Discovered the North Pole' is therefore also, tacitly, one of the most imperialistic:

> …assuredly there are many who will often picture to themselves that lonely vessel [*Fram*] and its weird electric star of civilisation shining on the frozen roof of the world during the long Arctic night.[35]

This sentence casts the Arctic as a wilderness into which Nansen brings civilisation in the form of, among other things, *Fram*'s electrical generator. As Earth's 'frozen roof', the Pole is the ultimate climbable summit. Nansen's mission becomes an ascent as well as a voyage, with the obvious metaphorical implications of supremacy for the person (and nation) 'on top' (earlier, Munro calls for the British flag to be planted 'on the very crown of the planet', p. 483). *Fram*'s 'electric star' in this passage suggests a similarly decorative act (the Earth as Christmas tree), but is also more obviously a light in a dark place, with overtones of moral authority and enlightenment. 'Civilisation', here meaning Western civilisation, acquires in this passage the beneficial metaphors of both height and brightness, underwritten with the scientifically-charged novelty of electricity. *Fram*'s electricity, here, is our first sign of science being called up in service of imperial symbology.

Unlike many of the territories into which the enlightened explorers and missionaries of Europe carried metaphors like these, the Arctic is at least, for the most part, genuinely a wilderness, with fewer natives to exploit. But this just increased its potential as a venue for the *fiction* by which Empire could be constructed: Jen Hill posits that 'the Arctic was a landscape on which assertions and critiques of nation and empire could unroll at a literal "safe distance"', its perceived 'blankness' a slate onto which imperial ideals could be drawn.[36] Julie

[35] Munro, p. 484.
[36] Jen Hill, *White Horizon: The Arctic in the Nineteenth-century British Imagination* (Albany, NY: State University of New York Press, 2008), p. 5.

F. Codell points out the role of periodicals in this process, saying that their readers 'derived their sense of their own and others' places and spaces from the press, which offered a major site for the production and re-production of national identities'.[37]

As Europe's latest ambassador to the polar regions, Nansen was described by the periodicals often in highly racialized terms:

> One feels insensibly that he is of the type of men fitted for Herculean tasks, and his physical form in no degree contradicts the record that he can bear fatigue and exposure, and is one of the most accomplished skilobers in Norway.[38]

In an earlier piece in the *Idler*, Bain had brought in Eva Nansen, Fridtjof's wife, in order to make a similar point:

> Nansen is more than six feet high. Fru Nansen, on the contrary, is *petite* and dark, and, withal, of as adventurous a spirit as her husband. Indeed, in this respect both are worthy descendants of a noble race.[39]

A few pages before that, Bain describes Nansen's earlier triumph – the first crossing of Greenland from East to West – and a rare mention of the Arctic's indigenous population is made:

> At considerable inconvenience and self-sacrifice and shock to his sensibilities – for the stench which arises from the filthy surroundings of the Eskimo is, to a refined European, appalling – Nansen lived their life in his endeavour to obtain an accurate knowledge of their habits.[40]

At this point on his journey, Nansen had crossed Greenland on foot and was taking refuge in an Eskimo habitation at Godthaab. After his trek, it's difficult to imagine him being picky about who offered respite to his party. Nonetheless, Bain makes it sound here as if putting up with the natives is almost as

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[37] Julie F. Codell, 'Imperial Co-Histories and the British and Colonial Press', in *Imperial Co-Histories: National Identities and the British and Colonial Press* (Madison, WI: Fairleigh Dickinson University Press, 2003), pp. 15–26 (p. 16).
[38] Bain, 'A Talk with Dr. Nansen', p. 694.
[39] J. Arthur Bain, 'The Nansens', *The Idler*, 9 (March 1896), 304–13 (p. 309).
[40] Bain, 'The Nansens', p. 306.

incomprehensibly noble an achievement as the crossing itself: an heroic piece of self-sacrifice, committed in the name of scientific data-gathering.

These racial divisions are repeatedly articulated in accounts of polar exploration, despite the comparative lack of native populations. They are most visible in accounts of Nansen's return to civilisation in 1896. The dramatic climax of his voyage in the *Fram* was his decision to leave the ship, accompanied by only one other member of the party, Hjalmar Johansen, and make a dash for the Pole on dog sleds. It was on this journey, while *Fram* drifted south with the remaining crew, that Nansen attained his highest latitude of 86°13.6′N – but the conditions, damage to the kayaks, and a lack of supplies on the return journey almost had disastrous consequences, and the two were forced to winter in Franz Joseph Land.[41] When, at the end of this experience, Nansen chanced to encounter the Jackson-Harmsworth surveying expedition:

> He was absolutely black from head to foot. His light hair and moustache were jet black, and there was not a speck of white about his face or hands. He looked for all the world like a nigger, and the brightness of his eyes was accentuated by the grime of his face which had been blackened by the blubber-smoke. His clothes were stiff with blood and oil, with which his face and hands were also covered.[42]

This description from Fisher, Jackson's botanist, quoted in an account of Nansen's voyage published in *The Leisure Hour* in November 1896, is the negative image of the 'tall, handsome specimen of a Scandinavian' described by Bain.[43] Living in the wilderness has forced Nansen to adopt many of the survival habits he learned in Godthaab, turning him savage in the eyes of Fisher. Jackson himself (also quoted in *The Leisure Hour*) describes the moment of their first meeting, which can easily be read as an attempt to extend the mantle of civilisation into the wilderness of Franz Joseph Land:

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[41] Nansen describes his journey in *Farthest North*, which was published just a few months after his return and swiftly translated into English, appearing in London in 1897. I have avoided direct use of this engaging account here in order to focus on the periodical press, but have quoted from reviews of it and the interviews with Nansen which surrounded its publication.
[42] Qtd. in Edward Whymper, 'Nansen and the North Pole', *The Leisure Hour*, November 1896, 25–32 (p. 31).
[43] Bain, 'The Nansens', p. 308.

> …I exclaimed, 'Aren't you Nansen?' 'Yes,' he replied, 'I am Nansen.' 'By Jove,' I responded, 'I really am awfully glad to see you!' Then we shook hands again still more heartily. 'Thank you very much,' said Nansen, 'very kind of you.'[44]

This cordial exchange, which is difficult to picture amidst the Arctic desolation without a smile, evokes the more famous meeting between Stanley and Livingstone in central Africa in November 1871.[45] It also resembles an Arctic encounter which had taken place a few years earlier on the *Investigator* at the moment marking the discovery of the North-West Passage.[46] After Nansen and Johansen establish themselves, despite appearances, as members of polite society via their knowledge of conversational pleasantries, they are welcomed onto Jackson's boat, the *Windward*. They wash off the discolouring grime, and are whisked back to society in record time.[47] Even in an environment where there are no savages (especially not black ones), the potential of the civilised explorer lapsing into becoming one seems ever-present.[48]

Another kind of 'savage' – a First Nations Canadian – plays a key role in Munro's fantasy of defeating Nansen with automated balloons. His first balloon, with its valuable photographic cargo, is recovered when a Dog Rib Indian shoots it down over the Northwest Territories:

> Not knowing what to make of it, and thinking it might be some 'strange medicine' of the white man, he and his family had taken it to Fort Enterprise…[49]

The aboriginal presence in Munro's story lasts less than a paragraph, but is underlined by being the subject of the final illustration in the story (one of only

[44] Qtd. in Whymper, p. 32.
[45] See Clare Pettitt, *Doctor Livingstone, I Presume?: Missionaries, Journalists, Explorers, and Empire* (Cambridge, MA: Harvard University Press, 2007).
[46] Hill, p. 20.
[47] 'They arrived at Vardö at half-past four in the afternoon of August 13, having got clear of ice in fifty-two hours after leaving Franz Josef Land!' (Whymper, p. 32).
[48] It deserves mentioning that none of the language I've quoted here is from Nansen himself, whose success in the arctic depended on a respect for the survival skills of the Samoyed people. Whilst the British obstinately refused to adopt native techniques (and suffered the disasters of the Franklin and Scott expeditions partly in consequence), Nansen employed Samoyeds on equal terms and was eager to learn from them. After retiring from exploration following his attempt on the Pole in 1896, he devoted the remainder of his life to diplomacy, representing Norway at the League of Nations and campaigning for the dispossessed, especially the victims of the Russian Famine. Roland Huntford's comprehensive biography *Nansen: The Explorer as Hero* (London: Duckworth, 1997) has the full story.
[49] Munro, p. 489.

six pictures in total). The image (Fig. 4.4) shows a highly stereotypical figure, complete with headdress and long, flowing robes, looking towards the incongruous shape of the balloon floating in the distance. Even the narrator is implicitly surprised by the Indian's presence: 'I must confess I had not expected any of the balloons to turn up in that quarter' (p. 489). Why is there suddenly a First Nations Canadian in Munro's fantastical story of automated polar exploration by balloon? The superficial answer to this question – amusement and variety for the readership – points towards a deeper explanation: that no tale of derring-do in the wilderness is quite complete without an uneducated native mistaking post-Enlightenment science for magic, the butt of a joke he could never get, whose humour turns on the implied superiority of the white races.[50] Jen Hill sums up the cumulative effect of all these racialized characterisations:

> Arctic space was revealed – perhaps as unexpectedly for contemporary Britons as it is to us – to be central to the ways Britons imagined, justified, and even critiqued their nation and empire.[51]

Even the more innocent fantasies which appeared in the periodicals could not escape the discourses which were irresistibly thrown up by the blank space on the map.

IV. Sir Robert Ball, W. L. Alden, and a System of Concentric Circles

The quest for the North Pole, then, was addressed in racialized terms as well as in terms of a 'race' between European powers. The Pole was an attractive target not only because of the challenge but also because of the metaphorical implications of being the power 'on top' of the world; discourses of superiority are at the heart of Arctic exploration. But there was another attractive quality which the Pole offered to provide those who reached it: coherence. 'The North Pole is that hitherto unattainable point on our globe', wrote Sir Robert Ball in the *Fortnightly Review* in 1893,

[50] For the Indian in nineteenth-century British popular culture, see Kate Flint, *The Transatlantic Indian, 1776-1930* (Princeton, NJ: Princeton University Press, 2009), pp. 161–6.
[51] Hill, p. 3.

> …on which, if an observer could take his station, he would find that the phenomena of the rising and the setting of stars, so familiar elsewhere, was non-existent.[52]

It would appear to Ball's hypothetical astronomer on the Pole as if the heavens rotated around him; as if he was at the very centre of things. This sensation was the subject of a story by the humorist W. L. Alden, published in the *Idler* in March 1897, which proposes that the illusion of being in the middle of the universe could drive somebody mad with power.

The piece can be read as a pastiche of Munro's style of polar tale, and like Munro's it is written with an onus on plausibility: ridiculous in its details, it is nonetheless entitled 'Very Cold Truth'. It is narrated at second-hand, told to its narrator by a mariner (Martin) who claims to be the sole survivor of an expedition which discovered the North Pole long before Nansen set off. '[T]wenty-nine years ago come next July' it was, says the Mariner. In the next paragraph: 'Twenty, let me see, I think I said twenty-eight years ago'.[53] Martin's story is as follows: he was on the crew of a whaler commanded by Captain Bill Shattuck, a man who in Martin's retelling, unbeknownst to the crew, has gone mad. Shattuck's delirium causes him to separate his ship from the whaling fleet and seek out the highest latitudes. The route proves dangerous, but Martin, Shattuck and a few survivors of the original crew finally find land. Danish-speaking natives, ignorant of the world beyond their own shores, direct them to 'some sort of stone chair that had been scooped out of the rock' which seems to have been there since before the natives arrived (p. 254). Sitting on the chair, which is, of course, situated directly on the North Pole, Shattuck becomes the observer imagined by Ball. His immediate reaction is that of a coloniser:

> 'All right!' says the old man. 'Thish-yer chair is the genuine North Pole, and I take possession of it in the name of the United States of America in general, and William G. Shattuck in particular.'[54]

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[52] Robert S. Ball, 'The Wanderings of the North Pole', *Fortnightly Review*, 54 (August 1893), 171–83 (p. 173).
[53] W. L. Alden, 'Very Cold Truth', *The Idler*, 11 (March 1897), 252–58 (p. 252).
[54] Alden, 'Very Cold Truth', p. 254.

The speech echoes Nemo's claim upon the South Pole, and seems straightforwardly imperial in nature, especially because it is made in the presence of the natives, who have lived on the island for centuries. But the colonising tone becomes even more explicit with what happens next:

> You see, being as we were at the Pole, the sun and all the stars revolved around us, same as a street does when you've had a drop too much. […] Now, Captain Shattuck, being stark mad, considered that when he sat on the North Pole we, as well as the sun and the stars, ought to revolve round him.[55]

The captain assigns his surviving crew orbits around him, dictates times that they are to wax, wane and eclipse each other, and sits at the centre as they do so. As he has the expedition's only pistols, the crew are compelled to do as he says. In spite of not speaking English or understanding the danger the guns represent, the natives also obey the captain's wishes, 'as meek as a crew of niggers': once again, a glancing dismissal of 'lesser' races seems unavoidable when treating of this subject (p. 256). When petitioned to leave, the captain reacts angrily:

> …I'm the centre of the solar system, and I'm not going to throw up a berth like that just in order to sneak back to New Bedford and to ask somebody to give me a ship![56]

Delirious beyond any reason, Shattuck eventually has to be killed before Martin can leave the island.

Shattuck's obsession with his own centrality, the result of the same mania which caused him to seek the Pole in the first place, was also evidently of persistent interest to Alden himself, who was, in writing this story, re-hashing an idea he had expressed in non-fiction the previous year. In his 'Wisdom Let Loose' column in the very first issue of *Pearson's Magazine*, he speculates on the possibility of a British expedition to the South Pole, adding:

> The moment the captain places himself at the pole, his personal axis will coincide with the axis of the earth, and he will immediately begin to revolve. His attendants will circle around

[55] Alden, 'Very Cold Truth', p. 254.
[56] Alden, 'Very Cold Truth', p. 256.

> him like so many satellites, and will have their days and nights, their phases, and other astronomical characteristics.[57]

In the column, natural forces cause the men to start revolving. In the story, written later and at greater length, the agency lies solely with the armed madman. Apart from this change, Alden migrates the concept from speculation ('will') to fiction ('did') remarkably intact. The satirical nature of both pieces notwithstanding, this is an idea which obviously resonated with Alden; which interested him enough that he kept it around and developed it.

A possible reason for both this resonance and the change from natural to human agency can be found in the fact that both pieces are fundamentally about structures of command. 'Very Cold Truth', is about Shattuck's abuse of power, returning repeatedly to the reasons for Martin's quiescence ('I didn't say anything, because I had shipped to obey orders, and not to talk'[58]). The *Pearson's Magazine* column, despite being far shorter, is equally engaged with the hierarchical dispositions of the revolving sailors:

> The commander will be liable at almost any moment to be eclipsed by an ordinary seaman, or to be forced into occultation with a midshipman.
> Whether this sort of thing will please a captain who is a strict disciplinarian may be doubted.[59]

Shattuck's claim that he's the 'centre of the solar system' when he sits on the North Pole seems strange to anyone familiar with the Copernican model, but unlike the naturally-occurring arrangement in 'Wisdom Let Loose', his is a man-made system: the sun and stars appear distant servants of Shattuck's gravitational pull, and the nearer revolutions of the island's natives and his crew (organised hierarchically, with Martin, as mate, closest) symbolise the captain's power by the orbits themselves as well as their submission to his humiliating whims.[60] Shattuck becomes the platonic imperial overlord, using both deadly force and a naturalising symbolism to maintain control over his subjects. Without any apparent prompting, the islanders take Shattuck for 'one of their leading gods' –

[57] W. L. Alden, 'Wisdom Let Loose', *Pearson's Magazine*, 1 (January 1896), 97–101 (p. 97).
[58] Alden, 'Very Cold Truth', p. 253.
[59] Alden, 'Wisdom Let Loose' (January 1896), p. 97.
[60] Alden, 'Very Cold Truth', p. 256.

the perfect imperial power structure seems innate to those caught within it, but is artificial to the point of hilarity from an outside perspective such as the reader's (p. 256). As I argued in the introduction, classification systems of disciplines or genres are at their most intransigent when it is forgotten that they are artificial. This eagerness to reach (and co-opt the imagery of) a natural-seeming centre, therefore, constitutes the first hint of a correlation between taxonomies of knowledge and the language of imperialism.

The Pole is an enticing symbolic target for an empire because the view from it, as Ball notes, grants the illusion of order. The heavens seem less chaotic:

> Each star viewed from the coign of vantage offered by the North Pole would move round and round in a horizontal circle; and the system of concentric circles would be directly overhead.[61]

Alden's tale foregrounds the powerful metaphorical implications of appearing to be in the centre of this natural system. To the language of 'height' and 'light' used to discuss polar exploration in John Munro's story, we can now add 'centrality'. The three form a powerful combination in a press based in London, the centre of the British Empire, and once again it's appropriate that the periodical is the medium here. Stam and Stam point out that periodicals produced by crews on polar voyages:

> …served at least one of the functions of their Victorian counterparts at home, that is, to unify their readers through the presentation of the familiar and comforting assumptions of the Victorian world view.[62]

Just as home-made periodicals on ships provided the artificial voice of the metropole to the explorers, so their commercial counterparts at the imperial centre narrativised into coherence the efforts of polar expeditions. They weren't simply discovering knowledge, they were ordering it. All of this perhaps throws light on an incidental comment J. Arthur Bain made about Nansen in the *Idler* in 1896: 'confusion is altogether unknown where he is'.[63]

[61] Ball, p. 173.
[62] David H. Stam and Deirdre C. Stam, p. 317.
[63] Bain, 'The Nansens', pp. 309–10.

Empire is the fantasy of being in the middle of a series of concentric circles. One of the reasons that the loss of the Franklin expedition had so traumatised Britain in the 1840s and 50s was surely that it showed an incoherent Arctic, far from the pure white space which Jen Hill argues the Victorians saw it as symbolically: a narrative-less void in which two entire boats full of men could simply disappear. Finding the North Pole was an opportunity to restore that coherence, for those at home as well as for the explorers themselves. It was a target of exploration not only because it represented one of the few remaining unknown places on the Earth, but also because, despite the fact that it had never 'been approached by man within 400 miles', so much *was* already known about it – through astronomy, it spoke to the Empire's fantasy of coherence.[64]

The coherence is truly a fantasy since, as Sarah Moss reminds us, 'there is no final point on the earth's surface at which it can be said that one is at the North Pole'.[65] There are multiple poles, and they move as the earth does; the idea of one, significant geographical North Pole is necessary for the concept of latitude, for the cartographic processes which made sea navigation reliable, and hence, empire possible. Those navigation systems were equally dependent on astronomy, reliably arranged around the observatory at Greenwich and its meridian, a line as imaginary as is the Pole. The observatory manifests the inseparability of astronomy, sea voyaging and empire, and all of these require an imagined ordering of the earth in order to work effectively. When it leaves the earth, sf by no means rids itself of these connections. Before discussing this, though, it is worth considering a less abstract way in which the Pole provoked imperial thought.

v. George Griffith and Tangible Commodities

A rather different approach to the Arctic is evident in *Pearson's Magazine*'s publication of George Griffith's 'A Corner in Lightning' (March 1898). So far, this chapter has – perhaps forgivably, in a literature thesis – focussed on the ways in which the quest for the North Pole was *metaphorically*

[64] Ball, p. 174.
[65] Sarah Moss, *Scott's Last Biscuit: The Literature of Polar Travel* (Oxford: Signal Books, 2006), p. 2.

resonant with the Imperial project. Griffith's story, though, with its unusually up-front approach, allows us to turn our attention to a more literal way in which the Arctic was attractive: its potential as a source of material wealth. Commerce was, of course, one of the driving forces of the British Empire, and by focussing on the entrepreneurial potential of the Pole through his science fiction lens, Griffith opens both empire and science to some difficult questions. There is extra relevance in this approach for a present-day reader, since commercial interests continue to have the largest stake in twenty-first century debates over the exploitation of Arctic resources.

'A Corner in Lightning' follows the endeavours of Calvert, a wealthy young man with 'a chilly glitter in the eyes' who, in collaboration with his friend, Professor Kenyon, has developed a scheme to harness the Earth's electrical energy.[66] This involves building a power plant on the Magnetic North Pole which will 'store up' the Earth's electricity, rendering all other generators on the planet useless and thus giving Calvert a complete monopoly over the commodity. His imperialistic motivations remain unabashed and straightforward: 'Just fancy what a glorious thing it will be to play Jove to the nations of the earth, and dole out lightning to them at so much a flash' (p. 267). Calvert ignores a warning from his friend the Professor, who tells him:

> …you propose to interfere very seriously with the distribution of one of the subtlest and least-known forces of Nature, and […] the consequences of such an interference might be most disastrous, not only for those engaged in the work, but even the whole hemisphere, and possibly the whole planet.[67]

The entrepreneur persists regardless, and though the planet does survive, it is wracked by storms and plagues, and the story ends with the destruction of Calvert's Arctic plant and the death of his infant daughter: a classic arc of hubris-nemesis for the mad scientist.

Crucially, however, Calvert is *not* a mad scientist. Neither is he an explorer. The opposite of Nansen, he is solely a financier, an 'ideas man' hiring scientific expertise from Kenyon and from Orloff Markovitch, the scheme's real

[66] George Griffith, 'A Corner in Lightning', *Pearson's Magazine*, 5 (March 1898), 264–71 (p. 264).
[67] Griffith, 'Corner in Lightning', p. 266.

originator (who dies dramatically at the end, but is otherwise absent from the entire narrative). Calvert also outsources his exploring and engineering to others who perform their roles namelessly in the background. Unusually for a tale of Arctic exploration, the scene of action never leaves London, in spite of the occasional departure of the main characters to both the Magnetic Pole and the south of France – its focus remains squarely on the heart of Imperial commerce. We hear of the Arctic only via the reports sent back by telegraph. When the electrical chaos unleashed by Calvert's dabbling shuts the telegraph down, we experience the suspense from the home side: what is currently happening with our overseas interests? This kind of suspense is perhaps less common in adventure fiction, but would have been *de rigueur* to the reading public who had, for example, waited three years for word of Nansen.

The most direct instance of imperial language emerges in the story's first scene, an after-dinner chat between Calvert and his wife. Mrs Calvert, like the professor, is opposed to her husband's reckless undertaking, and tries to dissuade him. Her first argument is a commercial one: 'surely you, one of the richest men in London, are rich enough to do without it'. She then changes tack, offering a moral objection: 'I'm sure it's wrong, too. What should we think if somebody managed to bottle up the atmosphere and made us pay for every breath we drew?' (p. 264). Only then does she turn to the risk argument which the professor will later recapitulate, albeit in terms of personal risk to her husband rather than risk to the safety of the planet. Calvert, though, sees only financial risk, and is happy to take it: 'I think that quite good enough to gamble on', he later says (p. 266). His immediate answers to his wife aren't answers at all. Fobbing off most of her objections on the grounds that 'it isn't fair' that she make them whilst looking at him (women are pretty; it would be unchivalrous of him to actually address the issues she raises), he concludes:

> …it would be quite impossible to run any business and make money out of it on the lines of the Sermon on the Mount. But, come, here's a convenient digression for both of us. That's the professor, I expect.[68]

[68] Griffith, 'Corner in Lightning', p. 265.

The digression is certainly convenient for one of them. Contrary to what Calvert tells the professor when he comes in, the bell doesn't interrupt an ethical discussion because the two aren't having one. With a little casual sexism, Calvert sidesteps the fact that the only objections he's prepared to consider are those couched in terms of a cost-benefit analysis. Calvert is described later as being '...thoroughly fascinated by the grandeur and magnitude, to say nothing of the dazzling financial aspects of the scheme': it's in this combination of grandstanding and profiteering that his imperial ideology can be most obviously seen at work (p. 266-67).

By highlighting the commercial side of imperialism, which sees exploration as an opportunity to exploit overseas interests for capital rather than anything else, this story illuminates the difficult side of the relationship between imperialism and science. When Professor Kenyon first presents himself, he makes it clear that he agrees with Calvert's wife about the moral advisability of the scheme but, after prompting from Calvert, he goes on to promise that his advice about the scientific details will be dispassionate: 'The ethics of the matter are no business of mine, nor have I anything to do with its commercial bearings' (p. 265). Kenyon has been retained to offer an objective, technical opinion. Though he has a moral position, he refuses to let it intrude into (or sever) his professional relationship with Calvert's scheme, and he goes on to provide technical advice without which it could never be put into practice. Since at least the establishment of the Royal Society in 1660, one of the ideals of science had been a healthy separation from the rest of the world. Discussions were to be only on the subject of knowledge:

> 'Their first purpose,' said Thomas Sprat, writing his 'history' of the Society when it was barely fledged, 'was no more, than onely the satisfaction of breathing a freer air, and of conversing in quiet one with another, without being ingag'd in the passions, and madness of that dismal Age'. The rules were clear: nothing about God; nothing about politics; nothing about 'News (other than what concern'd our business of Philosophy)'.[69]

[69] James Gleick, 'At the Beginning: More Things in Heaven and Earth', in *Seeing Further: The Story of Science and the Royal Society*, ed. by Bill Bryson (London: HarperPress, 2010), pp. 16–35 (p. 27).

Kenyon operates within this tradition, but it's a position he finds impossible to sustain. As the chaos indirectly caused by his actions goes on, he enters Calvert's sitting room once again with a rather different message:

> I wish to goodness that I had had nothing to do with the infernal business, for infernal it really is. Who are you that you should usurp one of the functions of the Almighty, for it is nothing less than that?[70]

The shift from characterising electricity as one of the 'forces of Nature' to 'one of the functions of the Almighty' alone is suggestive of the change wrought on the professor by his role in the catastrophe. The dispassionate stance he worked so carefully to maintain is precisely what Calvert opportunistically seized upon for financial gain. To show up the 'dispassionate' ideal for what it is, we perhaps need Latour again: 'the ideal of the transportation of information without discussion or deformation […] is *not* a description of what scientists do'.[71] Mary Midgley offers a complementary point: 'the vision of an omnicompetent science – a free-standing, autonomous skill with a monopoly of rationality that does all our thinking for us – is not workable'.[72]

Even if the Polar Storage Company hadn't failed spectacularly, Kenyon would still have been complicit in holding the Northern Hemisphere to ransom for the purposes of absurd and shameless profiteering. With the peripeteia of Calvert and Kenyon, Griffith critiques both commerce and science for their idealisation of amorality. As well as the nightmare of the (already, in 1898, almost unimaginable) world without electricity, Griffith seems to be offering the readers of *Pearson's* the idea that science and business can never be entirely value-free. As Roger Luckhurst and Josephine McDonagh have pointed out, the colonial encounter, 'as a structure of dominance and control […] leant a framework to all kinds of scientific endeavour'.[73] The most common example of this in periodical depictions of polar exploration was the bald heroism with which these scientific endeavours were usually charged. Of Nansen, for example, J. Arthur Bain writes:

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[70] Griffith, 'Corner in Lightning', p. 270.
[71] Latour, *Pandora's Hope*, p. 258 Original emphases.
[72] Mary Midgley, *Science and Poetry* (London: Routledge, 2001), pp. 36–37.
[73] Luckhurst and McDonagh, p. 9.

> The key of his life can be found in the answer he once made to a hostile critic – an answer that deserves to ring through the ages to comfort the doubters and faint-hearted: 'Man wants to know; when man no longer wants to know, he will no longer be man.'[74]

This sentiment is generally seen as a noble one. The explorer-scientist is, at face-value, a literal embodiment of science's metaphorical struggle in the laboratory: to push back the frontiers of the unknown. But a glance at the voyage of Nansen, in which he shot an enormous amount of wildlife, slept in a bear-skin sleeping-bag and returned rendered almost unrecognisable by his fight for sheer survival shows how problematic that analogy can be. The tension is discernable in Tony Harrison's recent characterisation of Nansen as a 'modern scientific Viking'.[75] In order to conduct polar science, Nansen needs to be anything but a dispassionate observer. He is a rugged survivor, a polymath who 'contributed articles to both scientific and sporting journals'.[76] The wilderness is not a laboratory. Nansen couldn't conduct controls or carry out blind sampling: science in the Arctic is red in tooth and claw.

None of this is to argue that Nansen's voyage wasn't a genuinely scientific one, rather the contrary. Latour repeatedly argues that 'the more connected a science is to the rest of the collective, the better it is'.[77] Arguing that science conceived as a mere observer is useless, he says:

> Yes, we live in a hybrid world made up at once of gods, people, stars, electrons, nuclear plants, and markets, and it is our duty to turn it into either an 'unruly shambles' or an 'ordered whole'…[78]

Once we dispense with Descartes, however,

> [t]he search for absolute certainty becomes less urgent, and thus there is no great difficulty in reconnecting with the relativism, the relations, the relativity on which the sciences have always thrived.[79]

[74] Bain, 'A Talk with Dr. Nansen', p. 694.
[75] Tony Harrison, *Fram* (London: Faber & Faber, 2008), p. 24.
[76] Bain, 'The Nansens', p. 305.
[77] Latour, *Pandora's Hope*, p. 18. I have de-emphasised this quotation.
[78] Latour, *Pandora's Hope*, p. 16.
[79] Latour, *Pandora's Hope*, p. 17.

Both Midgley and Latour argue that it needn't be to science's detriment to be connected to the rest of the collective. I've already noted the breadth of Nansen's talents, the combination of different aptitudes which helped him to make his mission a success. Bain's articles repeatedly emphasise this characteristic:

> Dr. Nansen is an exceptionally accomplished linguist, speaking several languages fluently. He is also an artist and photographer of no mean order, so much so that at one time it was proposed that he should devote his life to Art.[80]

The same diversity which made Nansen's voyage a scientific success is what made him an attractive figure to the periodicals, with their commercial interest in a wide market. Bain drew attention to the fact that Eva Nansen shares her husband's breadth of expertise: a mezzo-soprano, part of Grieg's musical circle, but also 'one of the most athletic women of the North', a champion skilober.[81] Everything appealing about the explorer, both on his travels and at home, stems from the integrity of his different connections to the collective. This can be seen as the basis at once of both his scientific authority and his popular appeal, and attractively explains why his 'disconnection' from the periodicals in 1893-6 was so keenly felt.

Griffith suggests that science shouldn't ignore its connections to the rest of the world; Latour suggests it can't. If this is the case, it becomes reasonable to ask why the noble image of objective empiricism is so often thrust upon it. One answer is that the act seems to amply serve the purposes of imperial propagandising. Latour himself regards the whole conversation as a top-down effort to silence the voice of the mob, a 'dramatic double bind' which has been going on since at least Plato, passed on to us through a modernist settlement at odds with reality.[82] However convincing one finds this view, both imperialism and empiricism are certainly, from their own perspectives, attempts to order a wilderness.

Although Nansen was not British, the status he and his undertakings attained in the British magazines can certainly be read as indicative of their

[80] Bain, 'The Nansens', pp. 306–07.
[81] J. Arthur Bain, 'Mrs. Nansen', *Strand Magazine*, 12 (November 1896), 593–96 (p. 596).
[82] Latour, *Pandora's Hope*, p. 244. Chapter 8 of this work contains Latour's nuanced argument about Plato.

vested interest in defending the ideals of imperialism *per se*. The 'Man wants to know' justification, which seems noble enough at first glance, is charged with the Enlightenment ideology which empowered the most devastating phase of European colonialism as well as all the breakthroughs in scientific research and thinking which we continue to profit from today. When science wasn't an active participant in the imperial project, its ideal of passivity made it easy enough to co-opt, just as Calvert co-opts Kenyon's expertise in Griffith's story. The two are harder to separate than we might like, so much so that we still think of exploration as an intrinsically noble activity: Bain's prediction that Nansen's attitude would 'ring through the ages' has so far been borne out.[83] Hence *Star Trek*'s unrelenting (and usually uninterrogated) quest 'to explore strange new worlds', whatever the consequences for us or them. Hence, also, physicist Brian Cox (my exemplar of twenty-first century popular science), responding to a question ahead of the National Theatre's 2011 production of *Frankenstein*: 'For me science is literally exploration, in the sense of getting on a boat'.[84] The job of the scientist is to stand on the border between the known and the unknown, taking small steps (as Nansen did literally, pushing away at the highest-attained latitude; as Cox does metaphorically at CERN). After mentioning the role played by amoral science in the Manhattan Project, however, Cox finished his answer by saying: 'What the moral responsibility of the explorer is… is an extremely complex question'. It may be lowbrow and over a century out of date, but Griffith's story highlights anxieties in the ethics of science which remain extremely pressing, and which are unlikely to diminish as the new frontiers of laboratory exploration (for example, stem cell research) continue to throw new hopes and fears open to both science and popular culture.

Questions of commerce and power continue to resonate in the modern Arctic, which is now supposed to contain 'upwards of 90 billion barrels of oil and 1.7 trillion cubic feet of natural gas reserves', the favourite commodities of the twenty-first century West.[85] Zachary Nathan Schulman has estimated the

[83] Bain, 'A Talk with Dr. Nansen', p. 694.
[84] Brian Cox, Richard Holmes, and Daniel Rosenthal, 'Platforms: Frankenstein's Science' (Live event: National Theatre, London, 4 March 2011).
[85] Zachary Nathan Schulman, 'Cryopolitics: The New Geopolitics of the Northwest Passage and Implications for Canadian Sovereignty' (unpublished MA, Washington, DC: George Washington University, 2009), p. 16 <http://gradworks.umi.com/14/67/1467471.html> [accessed 26 April 2011].

value of these resources at $7,225 billion. As the ice retreats around the Pole due to global warming and this potential wealth becomes increasingly accessible, the Arctic countries (Norway, Denmark, and the US, but especially Russia and Canada) are vying for control over them. Matters came to a head in 2007, when a Russian expedition used a submarine to plant a flag on the sea bed at the North Pole, a move, notes Schulman 'reminiscent of the grand geopolitics of the late 19th and early 20th centuries' (p. 6). Canadian Prime Minister Stephen Harper responded by announcing the construction of two new military bases in Resolute Bay and Nanisivik, saying 'Today's announcements tell the world that Canada has real, growing, long-term presence in the Arctic'.[86] Technology and global warming have changed much about the geopolitics of the Arctic circle, but the straightforwardness of the language in this dispute is still quite remarkable. Sarah Moss sums up our thirst for Arctic resources:

> We burn oil in order to travel further and faster than we could do without it, so that more people can see and know more about more of the world, and the result is that there is less of the world to see and know.[87]

'Science is literally exploration, in the sense of getting on a boat': it is worth remembering what those who got on boats to go exploring actually did, and what they still do.

VI. Ghosts, Matter, Truth

Griffith's story is helpful because of the self-consciousness with which it approaches the questions of science, commerce and Empire, but it's also useful to uncover them in places where they emerge rather in spite of themselves. If the relationship between Calvert and Kenyon can be read allegorically as that between Empire and Knowledge, then in less direct ways this conversation can be found playing out in numerous other pieces of writing on polar exploration in the periodical press. One such is Hamilton Drummond's 'A Secret of the South

[86] 'Canada to Strengthen Arctic Claim', *BBC News*, 2007 <http://news.bbc.co.uk/1/hi/world/americas/6941426.stm> [accessed 26 April 2011].
[87] Moss, p. 238.

Pole' (*Windsor*, April 1902). I want to use this story as a way into relating the arguments of the previous three sections of this chapter to those of its second – to argue that there is a distinctly imperial dimension to the close relationship between fact and fiction in these polar writings.

Drummond's tale can be summarized as follows: like Alden's 'Very Cold Truth', it takes the form of a tale told to the narrator by an ancient mariner, in this case a man called Cap'n Towson. Towson, a far less reflective storyteller than Griffith, is asked by the narrator about an 'irregular, flattish fragment' of an unusual substance – not quite metal or glass – found amongst his memorabilia.[88] He replies by telling the story of how, cast away with two others, he came across a hulk adrift in the middle of the Pacific. Apparently several hundred years old yet still mysteriously afloat, the hulk makes the sailors uneasy, but they board it in any case, as it represents a better chance of survival than their dinghy. It turns out to have been preserved by Antarctic ice, but it has also been filled with 'solid air', an invisible substance in which the unfortunate seaman who descends into the hold 'drowns'.

Drummond's story fits well into the structural template of a 'ghost ship' narrative - the fundamentals broadly mirror an episode in Poe's *Arthur Gordon Pym*, and the tale includes descriptive passages resonant with the tropes of supernatural horror. One of these describes the moment when Towson describes removing a tarpaulin from the roof of the hulk, saying:

> I give you my word it was like strippin' the dead, an' even now there are times when I lie awake o' nights that I can hear the soft rastle o' the rip o' the stuff ; an' when I hear it, the skin of my back creeps an' I go cold down the spine.[89]

Shane McCorristine has shown that narratives of polar exploration often have recourse to 'the language of the supernatural and the ghostly', arguing that the Arctic has always had a spectral appeal to both explorers and their readers.[90] Sure enough, when one of Towson's companions, Brady, is in the grip of the solid air,

[88] Hamilton Drummond, 'A Secret of the South Pole', *Windsor Magazine*, 15 (April 1902), 612–20 (p. 613).
[89] Drummond, p. 618.
[90] Shane McCorristine, 'The Supernatural Arctic: An Exploration', *Nordic Journal of English Studies*, 9 (2010), 47–70 (p. 52).

'['t]was all one as if he'd seen a ghost'.[91] Yet despite capitalising on the supernatural template, this is not a ghost story: the hulk is not haunted by spirits, but rather by '[s]ome kind of a gas, maybe, or fluid that turned to gas' (p. 619). Science stands in for the supernatural here. However absurd the idea of 'solid air' seems, its presence nonetheless reflects an attempt from Drummond to articulate a material basis for his apparently-supernatural adventure. By some definitions, this aligns 'A Secret of the South Pole' more closely with sf.

At the same time, the scary thing about the ship is not her spectral, departed crew but her threatening new cargo from an unknown place. Like 'A Corner in Lightning', and despite its title, Drummond's tale never actually visits the polar regions, discussing the South Pole only in terms of its exports. The Pole is present only in the 'solid air', a cargo which has no apparent commercial value and which kills those who would try to exploit it. This commodity anxiety opens the tale to being read in terms of trade and Empire. 'It's a noble calling is the sea, and I reckon England sucks her Empire out o' the salt water', reflects Towson on his career choices: there's nothing noble at all about his actions in the tale, and his refusal to reveal why he and his two fellows were cast away in the first place suggests that his character was far from above reproach (p. 614). The narrator speculates that Towson probably never earned the title 'captain': even a mariner with his dubious credentials, however, recognises the intrinsic links between seafaring and colonisation.

'A Secret of the South Pole' is driven by the inscrutability of the new substances which it describes: the solid air and the container which originally held it, part of which is the fragment which prompted the narrator's initial question to Towson. But as well as being an imperial anxiety, this is also an anxiety of science, in that new discoveries always carry the risk of unhorsing pre-existing systems of understanding by their failure to fit into them. Hence Towson's penultimate sentence: '…we don't know everything our side the world, for all our cocksure ways' (p. 620). This line too could be from a ghost story, but here the suggestion is not of a transcendental 'spirit realm' (or something like it) which can *never* be understood, but of an actual, physical type of understanding which the British Empire (for all its cocksure ways) currently *lacks*. Towson announces to the narrator that he intends to leave the baffling relic

[91] Drummond, p. 619.

of his adventure to the British Museum on his death: 'I s'pose they'll pound it to bits to see what it's made of. Even then they won't be any the wiser…' (p. 614). This is unsettling because the investigative tools of high empire (appropriately embodied by the British Museum) have been broken: Enlightenment atomism threatens to prove useless in the investigation of a piece of physical matter. The anxiety this generates implicitly binds science and empire together.

Here, the issue of plausibility resurfaces. Regarding Drummond's story as being fundamentally about tangible matter rather than intangible horror (reading it as sf rather than as a ghost story) throws new light on the amount of time his narrator spends – nearly the whole of the first page, the story being only nine pages long – discussing the plausibility of the tale and the reliability of Towson as a source of information. 'As to his experience, I have only himself as witness', says the narrator, after stressing that he is himself a landsman and not qualified to judge the man's seafaring claims (p. 612). These doubts are presented long before any hint of what the story is actually going to be about, and they strike a key-note of dubiousness which is quite perplexing – after all, we, as readers, know that the story isn't true, don't we? The dubiousness is compounded when the narrator adds that he believes Towson in spite of his doubts, saying:

> Those of my friends to whom I have retold his tales have not scrupled to call him liar, and certainly his stories were at times largely capable of disbelief. But for my part I always found it hard to doubt him ; he was so circumstantial, so fluent, so calmly level, so credulous of himself. There was no assertiveness, no subtle doubt lurking in an appeal for belief, but just a quiet assurance that disarmed incredulity. Your habitual liar has a way of calling the gods to witness that is in itself suspicious. With Towson there was none of that. The thing was so because it was so. It was as if Galileo said the sun moved because it moved, and not all the Pope Urbans in the world could make it a lie.[92]

Here, as in all fiction, the surety of truth lies in the conviction of the performance rather than at large in the world. The innocent-looking *as if* in the final sentence completely reverses science in its Baconian sense: Towson speaking is the equivalent of Galileo observing truth. This is the piece's stronger, subtler claim

[92] Drummond, p. 612.

to the mantle of science fiction, within which science is always subject, to some extent, to narrative diktat.

An important historical precedent for both the narrative subordination of truth and the use of the North Pole as locus of a science fictional journey had been set by Margaret Cavendish's compellingly eccentric *The Blazing World* in 1666. At the outset of this story, Cavendish's heroine is the unwilling passenger on a vessel driven by a storm so intense that 'they were not onely driven to the very end or point of the Pole of that World, but even to another Pole of another World, which joined close to it'.[93] As the boat approaches the Pole, the cold kills all the kidnappers. The heroine survives 'by the light of her Beauty, the heat of her Youth' and finds herself in another world (p. 154). Earth and the Blazing World are connected, Cavendish writes, in such a manner that:

> …it is impossible to round this Worlds Globe from Pole to Pole, so as we do from East to West; because the Poles of the other world, joining to the Poles of this, do not allow any further passage to surround the World that way; but if any one arrives to either of these Poles, he is either forced to return, or to enter into another World…[94]

Here, Cavendish offers a way of leaving the planet and travelling to another one long before the invention of anything approximating a spacecraft. The vessel is a normal wooden ship, and the gateway through which it must sail is the North Pole. The unavoidably imperial aspect of this dynamic (Europe, after all, was conquering the world with wooden ships in the Renaissance) is underlined when, only nine pages after making this passage, Cavendish's heroine is crowned Empress of the Blazing World. One of her first acts is to summon her most learned subjects to ask them 'how snow was made', 'whence the saltness of the sea did proceed?', and other scientific questions (pp. 168 & 174-75). These sorts of inquiries echo the meetings of the Royal Society, to which Cavendish, as a woman, was denied access. Re-enacting them here, though, does more than give Cavendish access to the discourses of science, for she also provides each question with an answer – her own speculation about our world, but final,

[93] Margaret Cavendish, 'Description of a New World, Called the Blazing World', in *Paper Bodies: A Margaret Cavendish Reader*, ed. by Sylvia Bowerbank and Sara Mendelson (Letchworth: Broadview, 2000), pp. 151–251 (p. 154).
[94] Cavendish, p. 156.

ontologically provable fact in the blazing world. This means that the text's imperial activity is not limited to the work of the Empress, who takes a fleet from the blazing world back to earth and uses it to establish Britain as the sovereign nation: the book also makes imperialistic claims on real-world scientific understanding. These claims are represented on an internal scale by the Empress's instruction to her subjects that some of their answers to her scientific questions are 'wrong' (they capitulate; the universe is re-ordered) and on an external scale by the book's publication as a companion piece to Cavendish's nonfictional *Observations Upon Experimental Philosophy*. Fiction and fact are once again working together, but this time the purpose is expressly one of conquest.

Cavendish's book is an important precedent for the *fin de siècle* Arctic works under discussion here for a number of reasons. Firstly, it relies for its effect on a confused relationship with truth (a character called 'Margaret Cavendish' is introduced about half-way in). Secondly, this relationship favours a narrative-led understanding of the world, which implicitly puts final truth under the control of the author. Finally, the book mirrors its (external) imperialistic claims over truth with explicit (internal) support of imperial exploration and conquest, made possible by the strategic and symbolic power of the North Pole. This glance at Cavendish therefore provides a deeper understanding of the fact that all the Arctic works I've discussed so far display an awkward relationship with truth: Alden and Drummond's texts both deliberately couch themselves as hearsay whilst at the same time implicitly insisting on their basis in fact, Griffith's is run through with misinformation and various kinds of communicational breakdown, and Munro's is, of course, highly reactive to contemporary events and seeks to situate itself plausibly within them. In chapter 2, I argued that these characteristics create fertile ground for a relationship between literature and science in the vessel of the periodical: here, I want to add that they were useful to the naturalising discourses of empire for many of the same reasons. The press itself played a crucial role in these locutions, as it 'manufactured an imaginary empire, at the same time that its nature was assumed by readers to be the 'real', a transmitter of 'true' events'.[95]

[95] Codell, p. 20.

Griffith's story cautions us about the involvement of amoral science in the machinations of imperial commerce. But this reading of Arctic stories from the periodical press reminds us that fiction was equally amoral and subject to complicity in the project of imperialism. By confusing or reinterpreting truth, fiction can explicitly and implicitly further the goals of the imperial project, weaving out of complexity the apparently basic order which was a vital component of empire's vision of itself. These tales were particularly well-positioned for two other reasons: they were published in general magazines, in the same pages as nonfictional material and with almost no distinction from it, and they were science-fictional insofar as they adopted a narrative architecture where fact appears to supersede narrative, but is in fact always junior to it. If sf carried this imperial baggage to the pole, it was certainly prepared to carry it beyond, as its ambitions, ahead of those of real-world scientists, widened to include exploring the stars. The next section discusses this transition.

VII. Stepping-stone to the Stars

Reading through the monthlies of the 1890s and 1900s, one is immediately struck by the abundance of tales of the sea. With the nautical adventure's resonances with the culture of any Empire, especially Britain's, this is perhaps to be expected, although the quantity is still a little humbling. It's dramatically easier to find a nautical adventure than it is to find a story with science-fictional elements, although, of course, many sf stories *are* nautical adventures, and nautical adventure in its various forms can also potentially include historical fiction, romances, ghost stories, detective fiction, and many other kinds of tale. Interest in maritime subjects is no less apparent in the non-fiction published by these magazines: the very next item after 'A Secret of the South Pole' in *Windsor Magazine* is a documentary of a 'cable hospital' consisting of a lavishly-illustrated series of interviews with the crew of a ship which maintains and repairs transatlantic telegraph cables. Towards the end of this article, one crewmember reflects on the fact that the ice often renders work on the cable impossible for lengthy periods of time, during which the crew is idle. He says:

> Here is a photograph taken off Nova Scotia, which depicts our happy little band engaged in a mild picnic on the ice. Cables and cable-repairing are at this period of enforced inactivity as remote from us as the North Pole![96]

This chapter's central argument about exploration, colonialism and science fiction could have been made by recourse to almost any of the vast archive of maritime articles – fictitious and otherwise – offered to us by the periodical press. But the idea of the Pole's 'remoteness', even to someone who has been much closer to it than most of his readers, is just one of the characteristics which gave it a particular place in the public imagination. Thus, McCorristine:

> Of much concern to first-time explorers were the haunting epistemological uncertainties that the polar experience inculcated: with mirages, optical illusions, and sensory nightmares an almost daily occurrence, commanders were keen to stress the new

[96] A. Wallis Myers, 'On Board A Cable Hospital', *Windsor Magazine*, 15 (April 1902), 621–28 (p. 628).

> aesthetic realities in the Arctic theatre, realities which seemed destined to scupper the coping mechanisms learnt back in England.[97]

The Pole is not only a blank space on the map, to be explored and conquered by Europeans, but also an imaginative space in which science appears to be confounded. Its spectrality, the way in which those who attempt to reach it encounter the uncanny folded alongside the scientifically explicable, the real alongside the fantastical (McCorristine calls this 'the Arctic sublime') make it an ideal staging-post for nautical fiction's departure from the planet. From Cavendish onwards, the transition from the North Pole to a distinctly new world seems entirely natural.

For an example of nautical writing inching its way towards the condition of sf, it's worth returning to Arthur Conan Doyle. The creator of Sherlock Holmes was an ardent imperialist who, as mentioned earlier, wrote several articles on the subject of his own Arctic voyage on a whaler in 1880. It's possible to discern in these articles several telling suggestions of the links between real Arctic and fictional space exploration. The first clue is in the title of one of the articles, 'The Glamour of the Arctic' (*The Idler*, July 1892). The 'glamour' here isn't just the excitement of brave adventurers on ships, or the nostalgia of a worthy trade which was by now on its last legs (although, for an imperial reading, it is also both of those things). It's also the glamour of the landscape itself, which Conan Doyle describes as a 'region of romance'.[98] The ethereality implied by 'romance' here goes nicely with McCorristine's 'Arctic sublime', as does the word 'glamour' itself, whose original Scots meaning of 'magic, enchantment, spell', was still current in the 1890s.[99] 'It is a region of purity', Conan Doyle says:

> …of white ice and of blue water, with no human dwelling within a thousand miles to sully the freshness of the breeze which blows across the icefields.[100]

[97] McCorristine, p. 51.
[98] Arthur Conan Doyle, 'The Glamour of the Arctic', *The Idler*, 1 (July 1892), 624–38 (p. 633).
[99] 'Glamour | Glamor, N.', *OED Online* (Oxford: Oxford University Press, 2011) <http://0-www.oed.com.catalogue.ulrls.lon.ac.uk/viewdictionaryentry/Entry/78690> [accessed 29 March 2011].
[100] Conan Doyle, 'Glamour of the Arctic', p. 632.

He spends some time discussing the mystery of the open polar seas and the possibility of reaching the Pole, relying frequently on the testimony of whaling captains, and admitting that allowances must be made 'for expansive talk over a pipe and a glass' – the same ambiguity extant in the fiction of Drummond and Alden, above (p. 633). Not only is there the same vagueness seen in the fictional pieces, but Conan Doyle ends with discussion of the 'medical and curative side' of the Arctic climate:

> Davos Platz has shown what cold can do in consumption, but in the life-giving air of the Arctic Circle no noxious germ can live. The only illness of any consequence which ever attacks a whaler is an explosive bullet.[101]

With this kind of restorative magic in the air (and the adventure implied by 'explosive bullet'), it is surely not impossible that a lost European civilisation flourishes on the other side of a barrier of Polar ice:

> Have they preserved some singular civilisation of their own, and are they still singing and drinking and fighting […] or have they been destroyed by the hated Skraelings, or have they, as is more likely, amalgamated with them, and produced a race of tow-headed, large-limbed Esquimaux? We must wait until some Nansen turns his steps in that direction before we can tell.[102]

The 'they' in this quotation are lost Danes from centuries ago, and Conan Doyle wasn't the only one to hypothesise about their continued existence. The fact that Alden's natives in 'Very Cold Truth', discussed above, are Danish speakers, suggests that he too is thinking of them. Many others have been interested in this posited ideal Scandinavian culture, isolated from decadent society behind a wall of cleansing ice. Yet Conan Doyle's treatment of it here is especially interesting since, we need to remind ourselves, this is purportedly a non-fictional piece about the whaling industry. Yet it also lapses into a distinctly science-fictional speculation about the future when Conan Doyle mentions an unfortunate seafarer who became tangled in a chain and dragged into the ocean by a whale's carcass:

[101] Conan Doyle, 'Glamour of the Arctic', p. 638.
[102] Conan Doyle, 'Glamour of the Arctic', p. 638.

> Some æons hence those two skeletons, the one hanging by the foot from the other, may grace the museum of a subtropical Greenland, or astonish the students of the Spitzbergen Institute of Anatomy.[103]

It's only with a handful of words in this one sentence, but Conan Doyle here implies a much wider consideration of the future than the inevitable demise of whaling. Here we have, potentially, continental drift, global warming and the rise of a new cultural superpower. As usual, my objective in making these points is not to argue that 'The Glamour of the Arctic' is sf, but rather to argue that the way in which the Arctic landscape was portrayed, its eerie unquantifiability, lent itself to writing about exploration, technology, the future, and other races – sf's big themes.

Conan Doyle's Arctic is made even more surreal by the imposition of human commodity culture on it. In a later article on the same subject, written for the *Strand*, he describes the 'murderous harvest' of sealing:

> It is brutal work, though not more brutal than that which goes on to supply every dinner-table in the country. And yet those glaring crimson pools upon the dazzling white of the ice-fields, under the peaceful silence of a blue Arctic sky, did seem a horrible intrusion.[104]

The focus on the 'supply and demand' justification, as well as its effect on the landscape, brings us to the most interesting link between these whaling articles and sf: the whales themselves. The creatures Conan Doyle's expedition hunted (specifically, the Greenland right whale, which we now call the Bowhead whale) are more tangible both as entities and objectives than a lost race of Danes, yet they are still tantalisingly difficult to track down and catch:

> That the whale entirely understands the mechanism of its own capture is beyond dispute. To swim backwards and forwards beneath a floe in the hope of cutting the rope against the sharp edge of the ice is a common device of the creature after being struck.[105]

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[103] Conan Doyle, 'Glamour of the Arctic', p. 632.
[104] Arthur Conan Doyle, 'Life on a Greenland Whaler', *Strand Magazine,* 13 (January 1897), 16–25 (p. 21).
[105] Conan Doyle, 'Glamour of the Arctic', p. 626.

After lingering for a while on the capacities of the whale's 'highly intelligent brain', Conan Doyle continues that should the reader manage to find one, 'he has a taste of sport which it would be ill to match':

> To play a salmon is a royal game, but when your fish weighs more than a suburban villa, and is worth a clear two thousand pounds […] it dwarfs all other experiences.[106]

The mention of the commodity value of whales here (Conan Doyle notes in the *Strand* piece that they are worth so much money because their numbers are decreasing so sharply[107]), as well as the straightforward superiority work done by scale, speak strongly to the imperial hunter's instinct – glory, profit, and sport. But it's the frequency with which Conan Doyle returns to the whale's intelligence which is really significant, for it goes beyond merely stressing their worthiness as quarry. After describing, rather vividly, the process of actually killing one, Conan Doyle offers this unexpected reflection:

> Yet amid all the excitement – and no one who has not held an oar in such a scene can tell how exciting it is – one's sympathies lie with the poor hunted creature. The whale has a small eye, little larger than that of a bullock, but I cannot easily forget the mute expostulation which I read in one, as it dimmed over in death within hand's touch of me. What could it guess, poor creature, of laws of supply and demand[…]?[108]

Conan Doyle is here face to face (or, rather, eye to eye) with a genuinely alien consciousness, one with strong resemblances to various imagined aliens in later works of science fiction.[109] There may be few human natives in the Greenland seas (other than the speculative ones), but there are certainly natives, perhaps the more empathetic for their entirely unfathomable yet readily-apparent intelligence. The empire hunts them anyway. Today, the Bowhead whale remains on the IUCN red list.

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[106] Conan Doyle, 'Glamour of the Arctic', p. 626.
[107] Conan Doyle, 'Life on a Greenland Whaler', p. 23.
[108] Conan Doyle, 'Glamour of the Arctic', p. 627.
[109] Large, unfathomable alien intelligences are ubiquitous in sf, but even if we limit ourselves merely to 'Space Whales' we can see recent examples in the TV show *Farscape* (1999-2003) and the 2010 *Doctor Who* episode 'The Beast Below'. Perhaps the most famous sf whales appear in *Star Trek IV: The Voyage Home* (1986) in which it is revealed that humpbacks are an alien race living on earth.

Conan Doyle wrote to impress. The glamour of the Arctic is something he evokes by stressing how different the Greenland seas are from the world inhabited by the London-based readers of the periodical press. He describes unfamiliar landscapes where 'night is but an expression',[110] magical, curative air, and giant, intelligent natives who can live up to a century – surely the stuff of fantasy. But he is also keen throughout to emphasise the material chain which connects this fantasy to the reader's reality, the 'long line of seamen, dockers, tanners, curers, triers, chandlers, leather merchants, and oil sellers' who take the whales to the centres of commerce.[111] By this keenness, if by nothing else, Conan Doyle's fantasy world becomes, in certain respects, a science fictional one. His writings show that the division between fantastical adventures in strange lands and the hard daily life of an imperial citizen of the metropole is far from an absolute one. The chain which links them is long, but it is real and can be followed.

With such a chain, we can also link the Pole explicitly to the idea of space travel. I have already mentioned in my discussion of W. L. Alden's 'Very Cold Truth' the perceived link between the Poles and Newtonian cosmology, as elaborated upon by Sir Robert Ball. But it is worth re-stressing here that the connection between astronomy and maritime navigation is impossible to overstate. Alfred T. Story, author of the account of Andreé's balloon voyage in the *Strand*, also described above, reminds us of this in a piece for *Pearson's Magazine* entitled 'Harnessing the Stars' (November 1896). In the opening paragraph, he says of the Greenwich Observatory that:

> For upwards of two hundred years it has been so intimately associated with our maritime affairs, that it may be said to have contributed, in a very large degree, towards our naval supremacy.[112]

As his title suggests, Story considers the work carried out at Greenwich as a literal way of bringing the heavens into the service of Empire. The stars are 'put in their harness and made to help our ships', and as with Conan Doyle and the

[110] Conan Doyle, 'Glamour of the Arctic', p. 629.
[111] Conan Doyle, 'Life on a Greenland Whaler', p. 21.
[112] Alfred T. Story, 'Harnessing the Stars', *Pearson's Magazine*, 2 (November 1896), 585–92 (p. 585).

whaling industry, Story is keen to demonstrate the everyday impact of something so apparently esoteric as stargazing:

> …working hand in hand with commerce, it has conduced to the cheapening of figs and to the putting of tea on the poor man's breakfast table.[113]

Historically, the objective, empirical, scientific attempt to understand the movements of the heavens led to the understanding of latitude, the development of precision timekeeping, and the cartographic techniques without which the British Empire would have been an impossible project. Hence John Masefield's celebrated 1902 line 'all I ask is a tall ship and a star to sail her by' – the ship is impossible without the star, and the line crops up again in *Star Trek V* and numerous other sf texts with good reason.[114] The importance of the Greenwich Observatory in this endeavour is something which I've already noted, and it's no coincidence that today, the National Maritime Museum and the Greenwich Observatory are one institution, two buildings on the same site. The 'starship' is an Imperial invention; since real ships were already entirely dependant on the heavens, it is unsurprising that sf took the imaginative leap necessary to travel to them as well as by them. As the location in the northern hemisphere around which the heavens appeared to cohere (Polaris, the North Star, the one fixed point in the night sky), the Pole was a natural channel through which this leap would take place.

Summing up Nansen's endeavour, Roland Huntford writes: 'After the scramble for Africa, the polar regions were the last great blanks upon the map. They saw the last act of terrestrial discovery before the leap into space'.[115] But the fact that the Arctic is a 'stepping-stone to the stars', a place where spectrality and science, known and unknown, intersect with exploration and colonialism in a way which empowers a genre to leave the planet, can also be read in one of the most enduring sci-fi novels of the *fin de siècle*. H. G. Wells's *The First Men in the Moon* first appeared in serial form in the *Strand* magazine in 1900-1. The

[113] Story, 'Harnessing the Stars', p. 585.
[114] John Masefield, 'Sea-Fever', in *Salt-Water Ballads* (London: Grant Richards, 1902), pp. 59–60 (p. 59).
[115] Roland Huntford, 'Introduction', in Fridtjof Nansen, *Farthest North* (London: Duckworth, 2000), p. vii.

novel describes the lunar voyage of Mr Cavor, the scientist, and Mr Bedford, the entrepreneur (and narrator), in an anti-gravity sphere of Cavor's devising. The pair's trip to the moon is undertaken by Cavor in the spirit of scientific curiosity, but is all about profit as far as Bedford is concerned. When Bedford first hears about Cavor's invention:

> An extraordinary possibility came rushing into my mind. Suddenly I saw as in a vision the whole solar system threaded with Cavorite liners and spheres *de luxe*. 'Rights of pre-emption,' came floating into my head – planetary rights of pre-emption. I recalled the old Spanish monopoly in American gold. It wasn't as though it was just this planet or that – it was all of them. […] 'I'm beginning to take it in,' I said; 'I'm beginning to take it in.' The transition from doubt to enthusiasm seemed to take scarcely any time at all. 'But this is tremendous!' I cried. 'This is Imperial! I haven't been dreaming this sort of thing.'[116]

Bedford views the enterprise as a form of prospecting, a way of unlocking the untold mineral wealth of other worlds. Cavor, a few lines earlier, has characterised the proposed voyage thus:

> After all, to go into space is not so much worse, if at all, than a Polar expedition. Men go on Polar expeditions.[117]

The comparison which Cavor makes is tantalising in a novel at least as thoughtful about Empire as Griffith is in 'A Corner in Lightning'. When Bedford, who is bankrupt, joins forces with Cavor, it is an attempt on his part to do as Calvert did to Kenyon; to capitalise on the fact that Cavor's quest for knowledge has given him tunnel-vision, that Cavor is only capable of displaying interest in distinctly scientific subjects. 'It isn't one man in a million has that twist', Bedford will later tell him, in frustration. 'Most men want- well, various things, but very few want knowledge for its own sake'.[118]

Having escaped from the clutches of the moon-dwellers, the Selenites, whom Cavor has stayed behind to try and understand (his straightforward

[116] H. G. Wells, 'The First Men in the Moon', *Strand Magazine*, 20 (December 1900), 697–705 (p. 698).
[117] Wells, 'First Men in the Moon' (December 1900), p. 698.
[118] H. G. Wells, 'The First Men in the Moon', *Strand Magazine*, 21 (April 1901), 400–09 (p. 402).

curiosity will end up costing him his life), Bedford sits on the moon and contemplates exploration in a passage which explicitly underlines Wells's main interests in the novel, and which is worth quoting at length:

> What is this spirit in man that urges him for ever to depart from happiness and security, to toil, to place himself in danger, to risk even a reasonable certainty of death? […] Sitting there in the midst of that useless moon gold, amidst the things of another world, I took count of all my life. Assuming I was to die a castaway upon the moon, I failed altogether to see what purpose I had served. I got no light on that point, but at any rate it was clearer to me than it had ever been in my life before that I was not serving my own purpose, that all my life I had in truth never served the purposes of my private life.[119]

In the book version, Bedford continues: 'Whose purposes, what purposes, was I serving?'.[120] Bedford's interrogations – of Cavor and of his own motivations – cast Nansen's heroic proclamation, 'Man wants to know; when man no longer wants to know, he will no longer be man' in a more sinister light. If Bedford has co-opted science's disinterestedness, this passage suggests, then his own material interestedness is also serving another, less overt, ideological purpose.

There are numerous other moments in *The First Men in the Moon* which speculate on the practices of exploration and Empire-building,[121] and to detail all of them would distract from the main argument I want to make here, which is that the moon in Wells's understanding is not just another world, visited imperially, but also refers to the Arctic as part of the trajectory by which its colonial protagonists leave Earth. Aaron Worth reads in Wells's moon echoes of British southern Africa, and whilst these comparisons are arresting, I believe that equally powerful associations with the North Pole can be made; associations which only add weight to Worth's general argument about the vivid links between imperialism and technology in Wells's writing.[122] Cavor's comment at the outset is not the only time that we are invited to consider the voyage in the Cavorite sphere as a form of polar exploration. 'Think yourself a sort of ultra-

[119] H. G. Wells, 'The First Men in the Moon', *Strand Magazine*, 21 (May 1901), 497–507 (p. 500).
[120] H. G. Wells, *The First Men in the Moon* (London: George Newnes, 1901), p. 223.
[121] See for instance McLean, pp. 131-32, for discussion of Wells's moon as a potential home for the empire's surplus population.
[122] Worth, p. 78.

Arctic voyager exploring the desolate places of space', he says later, when the sphere is descending towards the moon.[123] It eventually lands, at dawn, in a vast Arctic snowscape (Fig. 4.5):

> As we saw it first it was the wildest and most desolate of scenes. […] a disordered escarpment of drab and greyish rock, lined here and there with banks and crevices of snow.[124]

This 'snow' is actually 'mounds and masses of frozen air' (p. 33), which is evaporated by the rising sun shortly after the sphere lands to create an atmosphere: 'the Arctic appearance had gone altogether' (p. 35). A short while later, plants begin to grow before the eyes of the adventurers. Their life cycle, it appears, is to remain dormant through the lunar night, but with the coming of the sun and atmosphere there springs up a forest at remarkable speed:

> Imagine it! Imagine that dawn! The resurrection of the frozen air, the stirring and quickening of the soil, and then this silent uprising of vegetation, this unearthly ascent of fleshiness and spikes. Conceive it all lit by a blaze that would make the intensest sunlight of earth seem watery and weak. And still around this stirring jungle, wherever there was shadow, lingered banks of bluish snow.[125]

The Arctic is still recalled by details like the intensity of the sunlight, and the lingering snow serves as a reminder of the speed with which the desolate polar landscape has been transformed into a rich, fantasy world. That this transformation takes place before the eyes of the two adventurers draws attention to the fact that Wells doesn't just take them to the moon by putting them in a spacecraft, but also brings the moon to them by transforming one of the last wildernesses on earth into his alien world. The contact zone between the moon – fantasy – and Mr Bedford's sitting room – reality – is the ethereal wasteland of the Arctic. Just as in *The Blazing World*, the Arctic here is a gateway, passed through to get to the real discoveries.

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[123] Wells, 'First Men in the Moon' (December 1900), p. 704.
[124] H. G. Wells, 'The First Men in the Moon', *Strand Magazine*, 21 (January 1901), 30–41 (p. 32).
[125] Wells, 'First Men in the Moon' (January 1901), p. 36.

VIII. Jam Tomorrow

So far, I have contended that what the Victorian reading public found fascinating about polar exploration can be traced back to the imperial project. From the increasingly nightmarish prospect of being disconnected from modern communication networks – fiction rising up to fill the gap left by the simultaneous absence of Arctic voyagers – to the racial, metaphorical and commodity obsessions of both the fiction and non-fiction which concerned itself with exploration, the Pole was a flashpoint for all manner of imperial concerns, both ideological and practical. I have tried to show not only that exploration of all kinds is an intrinsically imperial activity, but also that the process of representing material truth – empirical science – is integrally bound to it; that the crossover zone between Arctic fiction, non-fiction, maritime fiction, and sf is extremely large, texts in all these categories being united, and to a purpose, by an ambiguous and/or interested relationship with reality. Bruno Latour's model of circulating reference suggests a mechanism by which this relationship might work – stronger fiction being buoyed up by retraceable connections to reality – but Latour is also concerned that classically-conceived science is never too far away from trying to silence the mob. Whether deliberately, as in stories like Griffith's 'A Corner in Lightning', or less so, as in Drummond's 'A Secret of the South Pole', *fin de siècle* sf frequently dealt with themes of exploration, capital (both cultural and material), technology, aspiration and privilege. Particularly when it did so in the spectral space of the Arctic, and in the material space of the periodical press, the connection to empire was unavoidable.

I have also argued that it was at least partly via the space of the polar wastelands, with all of these concerns very much in play, that imaginative literature was able to leave the surface of the planet and explore the stars. It would be ridiculous to suppose for a moment, given the weight and number of connections outlined above, that it left its attachment to empire behind when it did so – even the cursory reading of Wells undertaken above shows a relentless engagement with questions of colonialism, exploration and conquest, questions from which, as John Rieder so comprehensively documents, sf has remained far

from distant.[126] This final section discusses one more mechanism which continues to drive sf, and culture at large, to adventure among the stars: anticlimax.

When Bedford and Cavor first land on the moon, anticlimax is one of Bedford's first reactions: 'I feel somehow enormously disappointed. I had expected – I don't know what I had expected, but not this'.[127] The same dejection, or a hint of it, is detectable in a surprising amount of the writing on Arctic exploration in the periodicals. In Frank Powell's adventure story 'Wolf-Man', which appeared serially in the weekly *The Boys' World* in 1905, a brigade of adventurers set off to find the Pole in a submarine so sophisticated that it gets them there on the first page of the second instalment:

> 'And this is the lodestar of the explorers!', Garth exclaimed in disgust, 'to reach which so many lives have been sacrificed in the ice-fields of the Arctic Seas.'
> 'It is a terrible disappointment', muttered Mervyn.[128]

At this point, the pair are looking at an island volcano which is midway through erupting, and to which their metal submarine is held fast by a powerful magnetic field. It is perhaps fortunate that they didn't find the real North Pole, which is, as we now know, exactly as the Reverend Andrew A. W. Drew predicted when discussing Nansen's voyage in the *English Illustrated Magazine* just after the explorer set off:

> …the stout little *Fram* may come through in the summer of 1894, and he [Nansen] may tell us that he steamed up to N. latitude 90° and found there absolutely nothing to mark the fact that he alone of living men had reached the North Terrestrial Pole.[129]

The passage reads curiously after five pages advocating heroism and derring-do amongst the ice. But Drew is far from alone here. His sentiment recalls W. L. Alden's demand, quoted at the start of this chapter, that the Antarctic be left for

[126] See John Rieder, *Colonialism and the Emergence of Science Fiction* (Middletown, CT: Wesleyan University Press, 2008).
[127] Wells, 'First Men in the Moon' (January 1901), p. 32.
[128] Frank Powell, 'Wolf-Man: A Tale of Amazing Adventure in the Underworld', *The Boys' World*, 1 (10 October 1905), 308–10 (p. 308).
[129] Andrew A. W. Drew, 'The North Pole Up to Date: A Sketch', *English Illustrated Magazine*, #118 (July 1893), 735–40 (p. 740).

the romancers, a passage which provides the keynote for a host of other disappointed voices. Munro's 'How I Discovered the North Pole' opens with the admission that '[t]he Pole is a mere Abstraction'.[130] When Nansen returned having reached only 86°13', articles about his voyage were reluctant to call it a failure, but focussed instead upon the process by which Nansen and Johansen survived, and spoke little of the actual farthest north. In his ten-page account of the voyage, J. Arthur Bain says of the northernmost point of Nansen's voyage only that the terrain was 'impassable hummocky ice'.[131] Edward Whymper's article in *The Leisure Hour* is a celebration of an explorer 'victorious at all points' which nonetheless focuses almost entirely on Nansen's *return* journey from his highest latitude,[132] a point described only by a short quotation from Nansen himself:

> …I could see nothing but ice of the same description, hummock beyond hummock to the horizon, looking like a sea of frozen breakers, the whole time…[133]

'This was the turning-point', remarks Whymper, before swiftly moving on.

The image of two frost-covered figures in bearskins dragging themselves to the top of an ice-ridge, surveying the scene, looking at each other, and then laboriously turning round and beginning their descent is an extremely potent farce, and aptly embodies the failure which Tony Harrison is keen on dwelling over in his 2008 play *Fram*. Harrison focuses on how Nansen and Johansen are variously transformed by their failure to reach the Pole (they held their 'farthest north' record just five years), and though it takes great liberties with both characters, his play is nonetheless a telling indication that this sense of anticlimax has accompanied Nansen's legacy – in spite of the good work he dedicated his life to on his return, in spite of the fact that he and all of his crew returned alive (a considerable achievement), in spite of the fact that his theory about Arctic currents was proven correct, and in spite of his numerous contributions to scientific data on the polar regions.

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[130] Munro, p. 483.
[131] Bain, 'A Talk with Dr. Nansen', p. 701.
[132] Whymper, p. 32.
[133] Quoted in Whymper, p. 30.

Why is this Nansen's legacy? Because we don't really care about scientific data. '[T]he general public, not so philosophical', says Munro in his story, 'were more interested in the adventure than the science'.[134] As mentioned above, Munro's North is, like Nansen's, 'somewhat blurred and out of focus' (p. 489). 'I confess that I don't understand Nansen's scientific results, and don't particularly want to', notes Richard Le Gallienne, reviewing the book Nansen published on his return: 'All that really matters is Nansen himself'.[135] In fact, there is no scientific reason to go specifically to the North Pole (rather than, say, ten miles south of it). The 'race to the Pole' has only ever been about ceremony and nationalism, a fact which remains evident today in the existence of the 'Ceremonial South Pole', a model globe on a (literal) pole in the centre of Antarctica, surrounded by a concentric circle of twelve flags, one for each of the signatories of the Antarctic Treaty (Britain amongst them). A place for photo opportunities, the Ceremonial South Pole is some short distance away from the actual South Pole, which, due to the movements of both the ice plateau and the Earth's magnetic field, alters position very slightly each year and is marked only by a small stake. This separation of the real from the made-up, however practically motivated, indicates that many of the connections explored in this chapter have far from left us.

The North Pole is unmarked in a featureless ocean; the South Pole an indistinguishable point in the middle of a desert of ice. We have the privilege of living in an age where this is evident. But whilst we're clearly the better for knowing, a remarkable passage in Le Gallienne's review may justly give us pause:

> 'To travel hopefully is better than to arrive.' When the North Pole is at length actually reached, these words of Robert Louis Stevenson will be found written upon it, or 'writ in water' on that mathematical point of polar sea where it is conjectured the north end of the earth's axis may well come out: 'To travel hopefully is better than to arrive.' Arctic explorers, of all people, should remember that – let them just think for a moment how dull their lives will be when their great aim is at last accomplished. And if they don't mind, a day will come when there'll be no North Pole to find.[136]

[134] Munro, p. 483.
[135] Le Gallienne, p. 403.
[136] Le Gallienne, p. 403.

‘With the globe entirely penetrated, both poles mapped’, says Tony Harrison’s fictitious Nansen, ‘it leaves me with my energy completely sapped’.[137] ‘When we know everything about this earth’, Conan Doyle says in ‘The Glamour of the Arctic’, ‘the romance and the poetry will all have been wiped away from it. There is nothing so artistic as a haze’.[138] With the map increasingly filled in, the question is not ‘what now?’ but ‘where next?’. In ‘Wolf-Man’, the crew so disappointed with the magnetic volcano at the North Pole are quickly blasted into an underground world full of dinosaurs, giant vampire bats, and wolfish savages: ‘We started this trip as a North Polar expedition’, says one of them, ‘but it seems we are to end up with a journey to the centre of the earth’.[139] As with Cavendish and Wells, the Pole becomes a gateway to the *next* thing, rather than an end in itself. In the periodicals, it was all science, not just exploration, which got treated like this, as the conclusion to the article about the telegraph cable repair ship (for instance) makes clear:

> Remarkable as we have very rightly considered the work dealt with in this article to be, and wonderful, in its kind, as the Atlantic Cable’s original invention has proved, the world of science remains essentially one in which ‘the old order changeth, yielding place to the new,’ and to-day the world is following with keenest interest the young Marconi’s growing success with his infinitely more wonderful trans-Atlantic wireless telegraphy.[140]

Techno-fetishism and Nansen’s ‘Man wants to know’ conceit continue to move the goalposts as surely as Wells’s Arctic landscape blossoms into the Moon. An anecdote from Margaret Atwood’s essay on the history of the ‘mad scientist’ trope, describing the projectors in Swift’s *Gulliver’s Travels*, demonstrates this:

> [T]hey have tunnel vision – much like a present-day scientist quoted recently, who, when asked why he’d created a polio virus from scratch, answered that he’d done it because the polio virus was a simple one, and that next time he’d create a more complex virus. A question most of us would have understood to have meant, ‘Why did you do such a potentially dangerous thing?’ – a

[137] Harrison, p. 33.
[138] Conan Doyle, ‘Glamour of the Arctic’, p. 638.
[139] Powell, p. 309.
[140] Myers, p. 628.

> question about ends – was taken by him to be a question about means.[141]

'To travel hopefully is better than to arrive'. Are the means or the ends the important part of the scientific endeavour? In the twentieth century, humanity reached the South Pole (Amundsen used *Fram* for his trip to Antarctica), and found it a desert. The Apollo programme took us (or rather, took twelve white, male pilots and geologists) to the moon, which was also something of an anticlimax. The reaction? 'As I stand out here in the wonders of the unknown at Hadley', said Dave Scott, commander of Apollo 15, 'I sort of realize there's a fundamental truth to our nature. Man *must* explore'.[142] Spoken in July 1971, this echo of Nansen's proclamation shows a certain persistence of rhetoric, but of course it's the reference to 'fundamental truth', ever exploration's stalwart companion, which is really interesting.

Mars is next, already being explored with probes – the spiritual descendents, perhaps, of the balloons which Munro proposed to send to the Arctic with their cargo of automated cameras. One of them, *Opportunity*, stopped off to explore the Fram Crater, named after Nansen's ship, in April 2004; 'Fram' is Norwegian for 'Forward'. A manned mission to Mars is repeatedly mooted – sf has rehearsed it many times – and whilst the scientific value of such an undertaking is undeniable, it will be through the vexed rhetoric of exploration that we take off for wherever is next after that (there's the possibility of life under the ice of Europa, Jupiter's sixth moon…). The push/stretch trajectory of human exploration, and the fictions which have inspired it, suggest a passage from Barbara Fuchs's *Mimesis and Empire*:

> Viewed through the lens of chivalric romance, the conquistadors' advances in America seem the by-product of frustrated desires. Spanish expansion consists of a series of incidental conquests in a romance mode: the explorers set off for El Dorado and instead find Bolivia; they conquer Florida while seeking the Fountain of Youth. The perverse refusal of the landscape to furnish the exact

[141] Margaret Atwood, 'Of the Madness of Mad Scientists: Jonathan Swift's Grand Academy', in *Seeing Further: The Story of Science and the Royal Society*, ed. by Bill Bryson (London: HarperPress, 2010), pp. 36–57 (p. 46).
[142] Eric M. Jones, 'Deploying the Lunar Roving Vehicle', *Apollo 15 Lunar Surface Journal* <http://www.hq.nasa.gov/alsj/a15/a15.lrvdep.html> [accessed 6 September 2012].

> object of desire does not stop the expansion, but instead propels it forward.[143]

Fuchs is writing about seventeenth-century Spanish romances, not nineteenth-century British sf, but the parallel is exact. Sf in the periodical press helped to set up the cycle of 'frustrated desires' which empowered the ideology of the British Empire at its zenith. As Paul Fayter puts it: 'Science fiction not only reflected contemporary trends, but in suggesting new scientific and technical possibilities and applications, it helped create the expectation of change'.[144] 'Expectation' is the key word in this sentence; 'jam tomorrow', to borrow an idea from Lewis Carroll. You can promise all you want for the future as long as you then keep it in the future – and the future, as I argued in chapter 2, is something which sf and the periodicals always push away, even as they engage with it.

Mary Midgley points out that scientific advances have not been sufficient to quell our anxieties about the universe, the project on which, she says, Epicurus originally embarked:

> We still live largely in the future rather than in the present. We still plan crowds of incompatible schemes and are continually disappointed. Most of us, whether or not we are scientifically educated, still live on jam tomorrow instead of soberly enjoying what we have while we have it…[145]

Each discovery in science yields up more questions, another thing which needs exploring. This characterisation suits Midgley, who goes far further than I have in regarding science as a discipline which is inherently imperialistic, rather than simply amenable to co-option by imperialism. Doubtless the situation is more complex than either of us have had space to describe, but what Midgley really offers this argument is a wider perspective on society's preoccupation with scientific innovation:

> Out of this fascination with new power there arises our current huge expansion of technology, much of it useful, much not, and the sheer size of it (as we now see) dangerously wasteful of

[143] Barbara Fuchs, *Mimesis and Empire: The New World, Islam, and European Identities* (Cambridge: Cambridge University Press, 2001), pp. 18–19.
[144] Fayter, p. 258.
[145] Midgley, p. 29.

> resources. It is hard for us to break out of this circle of increasing needs because our age is remarkably preoccupied with the vision of continually improving means rather than saving ourselves trouble by reflecting on ends.[146]

Here, anticlimax spurs us on rather than making us stop and think. Midgley's distinction could help explain the structure of the writing I've discussed in this chapter, nearly all of which tends to focus on journey rather than on destination: the 'white-out' at the end of *Arthur Gordon Pym*; Munro's promise that his actual data on the North Pole will be released (with photographs) in a subsequent publication; the absence of the Arctic/Antarctic as a location in 'A Corner in Lightning' and 'A Secret of the South Pole'. To return to the incident with which this chapter began, these are all structural equivalents of Conan Doyle's failure to leave a body after the death of Sherlock Holmes, allowing for the possibility of his 'resurrection' a decade later despite the fact that he had wearied of his most famous creation and wanted nothing more to do with him. Like the Holmes stories, much of the polar literature I've discussed here seems inherently sceptical of endings, a fact visibly at odds with the notion that they have 'much in common with the quest narrative', a comparison which would imply a distinct objective.[147] This tension is perhaps what makes them such a fertile area of study, and it is appropriately situated within the vessel of the periodical, a mode equally sceptical of endings. It could explain why magazines formed an integral part of the imperial media; their form, by definition without start or end, matches the journey-centric ideal of an eternal empire. There is an appropriate metaphorical resonance here with real polar conditions – numerous British expeditions were unsuccessful because in the Arctic, as Sarah Moss explains, '[y]ou can put one foot in front of the other for weeks and still find that your only progress is backwards because the ice is moving south faster than you can walk north'.[148] In this sense, the Pole tempts empire not just by providing a proving ground, or even coherence, but by the very fact of its unattainability.

These ideas are beautifully distilled in one of Jerome K. Jerome's *Letters to Clorinda*. Published serially in the *Idler* when Jerome was still editor, the letters are an eclectic mix of Jerome's thoughts that month; a series of

[146] Midgley, p. 36.
[147] Moss, p. 29.
[148] Moss, pp. 1–2.

ruminations, often connected only extremely loosely, characterised by their quick wit and the occasional moment of real profundity. An example of the latter is found in the April 1896 issue, when Nansen had been unheard of for almost three years. Jerome begins the piece light-heartedly, discussing the New Woman and bicycles, and slowly his discussion moves round to the idea, one he sees as backed by science, that human progress is a cumulative process, building to a glorious, undefined future. 'Through sorrow and through struggle', he writes, 'by the sweat of brain and brow, he will lift himself towards the angels. He will come into his kingdom'.[149] This is the philosophical (and evolutionary) equivalent of the pattern of cumulative exploration which I've outlined, and Jerome is not slow to question it:

> But why the building? Why the passing of the countless ages? […] Why the Pict and Hun that I may be here? Why me, that a child of my own, to whom I shall seem a savage, may come after me? Why, if the universe be ordered by a Creator, to whom all things are possible, the protoplasmic cell? Why not the man that is to be? Shall all the generations be so much human waste that he may live? Am I but the soil preparing for him?
> Or if our future is in other spheres, then why the need of this world?[150]

Here, in the *Idler*, a less establishment-driven periodical than the others examined in this chapter, the 'jam tomorrow' approach of the political orthodoxy is really on trial. Jerome's answer to his own question is a curious one – maybe it's not for us to understand, he says; 'May be, we are as school children asking, 'Of what use are these lessons?' […] So perhaps when we are a little more grown up, we too may begin to understand the reason for our tasks' (p. 474). Immediately after this trusting optimism, though, he turns abruptly back to nostalgia:

> I shall be half sorry if it prove true that Nansen has discovered the North Pole. The world grows so small, and with its shrinkage life grows small, also, to us. Think what existence must have meant to the lad of two thousand years ago who dared and dreamed. All things were possible to him.[151]

[149] Jerome K. Jerome, 'Letters to Clorinda', *The Idler*, 9 (April 1896), 470–75 (p. 473).
[150] Jerome, p. 473.
[151] Jerome, p. 474.

There's an echo of this in Sarah Moss's point, quoted above, that our burning of oil to know the Arctic is causing its destruction, and perhaps another, less intentional resonance in one of the British Library's slogans: 'Expand your mind, shrink the world'. For Mary Midgley, too, global warming is the result of a failure to think about science in terms of ends.

Jerome goes on to directly speculate about the possibilities which contact with extraterrestrials would present, the ways in which it would galvanise humanity to actually be confronted with something entirely new. The passage is a fascinating one, but I need not quote it here for Jerome's questioning of the 'progress' model of culture (a model to which literary criticism has been far from unsusceptible) to be clear. After a wild, fantastical description of what the aliens may be like, Jerome concludes his letter, offhandedly, with the line 'Wells is pushing rapidly to the front. In some of his shorter stories he is as good as Kipling at his best' (p. 475). This is a joke about the evolutionary ideas which Jerome has just been playing with, but there's also the hint in it that approval of empire (Kipling) is beginning to be overtaken by a voice which sought to subject its ethos to scrutiny (Wells).

'May Nansen live to make more such expeditions', wrote Le Gallienne, after the explorer completed his adventure, 'but, for his own sake, may he never reach the pole'.[152] *Fram*; forward. The journey, not the destination, is the point. Journeys are the point of stories as well: the quest, in both fact and fiction, is to understand ourselves as well as the world. To really do that, though, we need to be under no delusions about what motivates the voice which tells us, always and forever, that the *next* hurdle is the big one, that the *next* peak, island or planet is the final goal. Jam tomorrow. It's possible to know everything. All it will take is one more little step, further northward.

[152] Le Gallienne, p. 405.

Conclusion: Bad Science and the Study of English

The diversity of the periodicals, for which I have been making a case throughout this thesis, had limits. Standard Illustrated Popular Magazines gave only seriously stymied expression to women, offered no voice at all to ethnic minorities, were pitched, in the case of the illustrated monthlies, firmly and finally at middle class readers, and edited almost exclusively by white, male imperialists. For all the commitment to democracy which made them such an awkward site for science – discussed in chapter 3 – they were nevertheless, as chapter 4 shows, thoroughly entangled in the overriding discourse of empire. The lack of outside voices in these publications and their failure to evince a truly representative democracy is not surprising, for the New Journalism was primarily a commercial enterprise, and its magazines were produced for the middle-class readers of London at the zenith of the British Empire.

Even amongst the most avowedly pro-imperial articles, however, it is possible to find examples of science and fiction being used in concert. Throughout this project, from my close reading of Galton's sun signals outward, I have been providing evidence that the two are anything other than *innately* opposed; chapter 4 demonstrates that the combination of the two could be so effective that it was an important tool of the imperial dominant discourse. Both 'sides' of the notional two-culture divide were deployed in service of empire, each bolstering the other to create the ideological, technological, narrative, and empirical conditions for a global enterprise of conquest and repression. Empire was also dependant on categories, from the vast bureaucracy of the Raj to an

ordering of the world which naturalised and sanctioned British competition with and violence against peoples classified otherwise.

Things are never as straightforward as binary opposition implies. The beguiling simplicity of these pairings is evidence not of their fundamental, underlying truth but of years of nuanced enrolment processes carried out by a diverse range of actants. Sf is a seemingly-intuitive (although impossible to define) category woven out of a rich miasma of conflicting and conflicted texts by Hugo Gernsback and his many inheritors. The British Empire, working intensively to create and naturalise the fundamental binary 'us/them', was also dependant on complex processes, on connections, alliances, profusion, and exchange. Models such as the 'two cultures' elide these processes, carrying empire's us/them dichotomy into the taxonomy of knowledges and paving the way for intense imperial combat on a disciplinary level. '*All* knowledge is, as I said just now, interesting', declared Matthew Arnold, in a speech which is now supposed (following enrolment) to have prefigured the fundamental opposition between Literature and Science.[1] Recalling my quotation from George Levine in the introduction to this thesis (p. 36, above), Arnold holds that no person is as simple as an oppositional hierarchy of knowledges presupposes:

> [E]very one knows how we seek naturally to combine the pieces of our knowledge together, to bring them under general rules, to relate them to principles; and how unsatisfactory and tiresome it would be to go on for ever learning lists of exceptions, or accumulating items of fact which must stand isolated.[2]

The general magazine imperfectly reflects the complexity of our inner voices, its commercial impetus for mass appeal producing an object which can address many sides of an individual as well as many individuals in a society. Yet for all its insistence on this array of difference – different genres, different ontologies, different subject matter – the periodical still reaches us as a coherent single entity; rendered commensurate by the eliding circumstances of editing, materiality, and politics of which it is a product. The periodical, then, shares with binary opposition (and human individuals) the quality of appearing (and therefore being) coherent on a macro level, but fostering enormous inner

[1] Arnold, 'Literature and Science', p. 62. My emphasis.
[2] Arnold, 'Literature and Science', pp. 62–63.

complexity once examined up close. Perhaps this is what gives it the powerful capacity identified in my introduction, the ability to hold contradictions in suspension. The magazine is conflicted – never more so than when active in the service of both heteroglossia and empire – but able to function despite that conflict, and perhaps even because of it.

My notion in this thesis has been that we may ask the periodical to hold one more contradiction in suspension: that we may ask it to teach us about the historical processes of division and subdivision – the imperial processes of enrolment, categorisation, and exploration – which it both documented and materially contributed to, *and* to provide us with a model by which these processes may be exposed and resisted. The construction of opposites is an invitation to conflict: the periodical, meanwhile, offers a formal opportunity for peace whilst at the same time preserving difference. Its commercial insistence on variety is translatable into a theoretical framework which revels in, rather than deplores, the diffuseness of human thought. In short, this has been an argument for complexity: for nuance over generalisation and for contradiction over the fantasy of coherence. We all need generalised categories in order to advance our thinking in this world in which there is already too much for any one of us to know, but remaining aware of their histories and mechanics, or at least of the fact that they *have* histories and mechanics, can prevent us from using them imperially; opposing them with each other, noticing and amplifying conflict rather than harmony, and shutting down conversation.

Addressing the two-culture divide specifically, it may at first seem as if this ideology of contradiction is antithetical to the scientific worldview, in which certain questions about the universe have unambiguously right and wrong answers. To assume this, however, is to confuse the process of science with the verifiable body of knowledge which it generates. In fact, that body of knowledge is augmented, rather than restricted, by a culture in which all pronouncements are open to contradiction:

> …real science is all about critically appraising the evidence for somebody else's position. That's what happens in academic journals. That's what happens at academic conferences. The Q&A

> session after a postdoc presents data is often a blood bath. And nobody minds that. We actively welcome it.[3]

Thus scientific truth is, Latour would say, composed. As I argued in chapter 2 (p. 99, above), it is significant that the journal format plays a role in this process. I have repeatedly drawn attention to the fact that an abiding interest in the location of truth is detectable whenever science and fiction are in close proximity in the periodicals – but this is not to say that either the scientific establishment or the periodicals themselves are value-free. On the contrary, they are repeatedly at pains to interrogate and generate truth according to their own core mechanisms, be they ambiguity, democracy, empiricism, or anticlimax. It is for this reason among others that I have argued here that both science and periodicals are in a sense better regarded as processes, composing or aiding in the composition of books and knowledge. Of course, they may be other (contradictory) things too: ideologies, sources of income, incitement to create art, producers and disseminators of understanding, and more besides.

Things are always more complicated than a straightforward taxonomy suggests, as Ben Goldacre, whose catchphrase in *Bad Science* is 'I think you'll find it's a bit more complicated than that', is keenly aware.[4] Goldacre's understanding of this complexity is evident in the fact that, despite his declared scepticism of the humanities, he acts in his book as an adroit cultural critic, seeking social as well as empirical solutions to a problem – the media's mishandling of science – which is ultimately not about scientific practices so much as it is about the activity of science in culture.[5] That scholarship in the

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[3] Ben Goldacre, 'Battling Bad Science', *TED.com*, 2011 <http://www.ted.com/talks/ben_goldacre_battling_bad_science.html> [accessed 11 October 2012]. See also Goldacre, *Bad Science*, p. 317.

[4] Goldacre, *Bad Science*, p. 100.

[5] Throughout the book, Goldacre problematises media reporting of supposed new miracle treatments by drawing attention to the complex social dimension of disease. This underlies his explanation of the placebo effect, in which social expectations effect measurable medical outcomes (pp. 81-82), and it is also in focus when he turns to the political dimension of pseudoscience, pointing out that bogus research is often conducted or publicised in order to reinforce dominant ideologies, especially of class (pp. 132-33). Goldacre is strongest on the cultural roots of bad science, though, in an early passage which links detox regimes to religious cleansing rituals, worth quoting at length: 'The presentation of these purification diets and rituals has always been a product of their time and place, and now that science is our dominant explanatory framework for the natural and moral world, for right or wrong, it's natural that we should bolt a bastardised pseudoscientific justification onto our redemption. Like so much of the nonsense in bad science, 'detox' pseudoscience isn't something done *to* us, by venal and exploitative outsiders: it is a cultural product, a recurring theme, and we do it to ourselves' (p. 12, original emphasis).

humanities can contribute to the understanding of this problem – its precedents, mechanics, and solutions – has been an implicit argument of the above work, and I have been trying to show, both by examining the media portrayal of science at the *fin de siècle* and tracing its connections, occasionally, into the present day, what such a study might look like.

For all his disavowal of the practices of the humanities, Goldacre makes a sustained and persuasive argument for critical reading – of the press as well as of scientific papers.[6] *Bad Science*, seen a certain way, has at its centre the message that science reporting needs to be approached anything other than passively – that the general readers to whom today's mass media addresses itself lack the skills and/or motivation to follow up on specious claims, investigate the studies quoted in the news, or interrogate the politics which may underlie a specific reporter's choice to emphasise or deemphasise certain kinds of story. Repeatedly, Goldacre stresses that special expertise is not necessary to perform this kind of basic reading. At the same time, media figures such as Patrick Holford and Gillian McKeith, whom Goldacre sees as charlatans, are important not because of the damage they can do to impressionable individuals so much as because they represent 'a menace to the public understanding of science'.[7] It is at this point, perhaps, with the cultural valency of disease, the media's implication in the spread of scientific misinformation, and the value of acute reading all prominently on the table, that English Studies is positioned to be of significant value.

With his emphasis on the damage caused by ignorance and unwillingness to learn, and his keenness for the introduction of evidence-based medicine into schools and museums, Goldacre is fundamentally interested in *education*; it is too often forgotten that educational policy (rather than abstract disciplinary demarcation) was the subject of the 'original' two cultures debates between Arnold and Huxley, Snow and Leavis. It is also a favourite subject of Stefan Collini, who, in a recent book about the purpose of higher education, writes:

[6] 'In fact, as you know, I claim no special expertise whatsoever: I hope I can read and critically appraise medical academic literature – something common to all recent medical graduates – and I apply this pedestrian skill to the millionaire businesspeople who drive our culture's understanding of science' (Goldacre, *Bad Science*, p. 134).
[7] Goldacre, *Bad Science*, p. 116.

> The mind is engaged much more fully by trying to understand something that initially resists our categories than by encountering a further instance of what is already familiar.[8]

The totemic status of the two culture debate, the notional separation of literature and science, pushes education away from the idea that challenging categories is an essential component of intellectual development. But Collini's book is also a reminder that the battles between disciplines are about economics as much as territory: the increasingly corporate nature of British universities, which casts them as rivals rather than allies, and which pits departments and individual scholars against each other in competition for funding, is a profound distraction from the fact that 'All knowledge is, as I said just now, interesting'.

When scrutinized, general magazines of the *fin de siècle* evince a similar weakness before the authoritarian (fiscal) power discourses of a totalising ideology. But such scrutiny also gives the lie to the notion, adopted for intellectual and bureaucratic convenience, that human modes of pursuing knowledge are necessarily and fundamentally opposed. As Ludmilla Jordanova has written:

> We know all too well that we are the inheritors of long, weighty traditions that separate out types of knowledge, institutions and practices, making it necessary for us to join, by scholarly means, what was put asunder by historical processes.[9]

Jordanova stresses that this is not an easy enterprise. I suggest that the classroom is where it could most profitably be conducted. Goldacre – correctly, in my view – places much of the blame for the media's poor understanding of science on the shoulders of the humanities graduates who run journalism, people who leave university having never been asked to question the assumptions of the two culture divide, having never been invited to find science interesting, having been implicitly instructed (often since primary school) that no aptitude can encompass the mutually exclusive fields of art and science.[10] Specific ignorance of scientific facts is less damaging here than a general failure to apprehend the ways in which

[8] Collini, *What are Universities For?*, p. 11.
[9] Ludmilla Jordanova, 'And?: Essay Review', *British Journal for the History of Science*, 35 (2002), 341–45 (p. 345).
[10] Goldacre, *Bad Science*, pp. 224–25 &ff.

science goes about making its claims. Despite its poor track record in perpetuating this state of affairs, English Studies is nevertheless ideally positioned to improve it, to produce graduates capable of critically reading science and fiction in the media. Without claiming expertise in scientific subjects – without thinking imperially – we can show connections, reveal historical associations, shed light on ideological commonalities. A first step in doing so is to avoid the language of conflict; to caution against the easy opposition of categories of knowledge. Resisting the marketization of the academy can be achieved by continuing to think outside the boxes in which its institutional architecture places us; by the same token, the path to be beaten in improving both relations between disciplines and the universities' standing with general public is to educate our students – on both 'sides' – about the deficiencies of dyadic division, and the complex nature of the general interest afforded by the study of people and things.

Illustrations

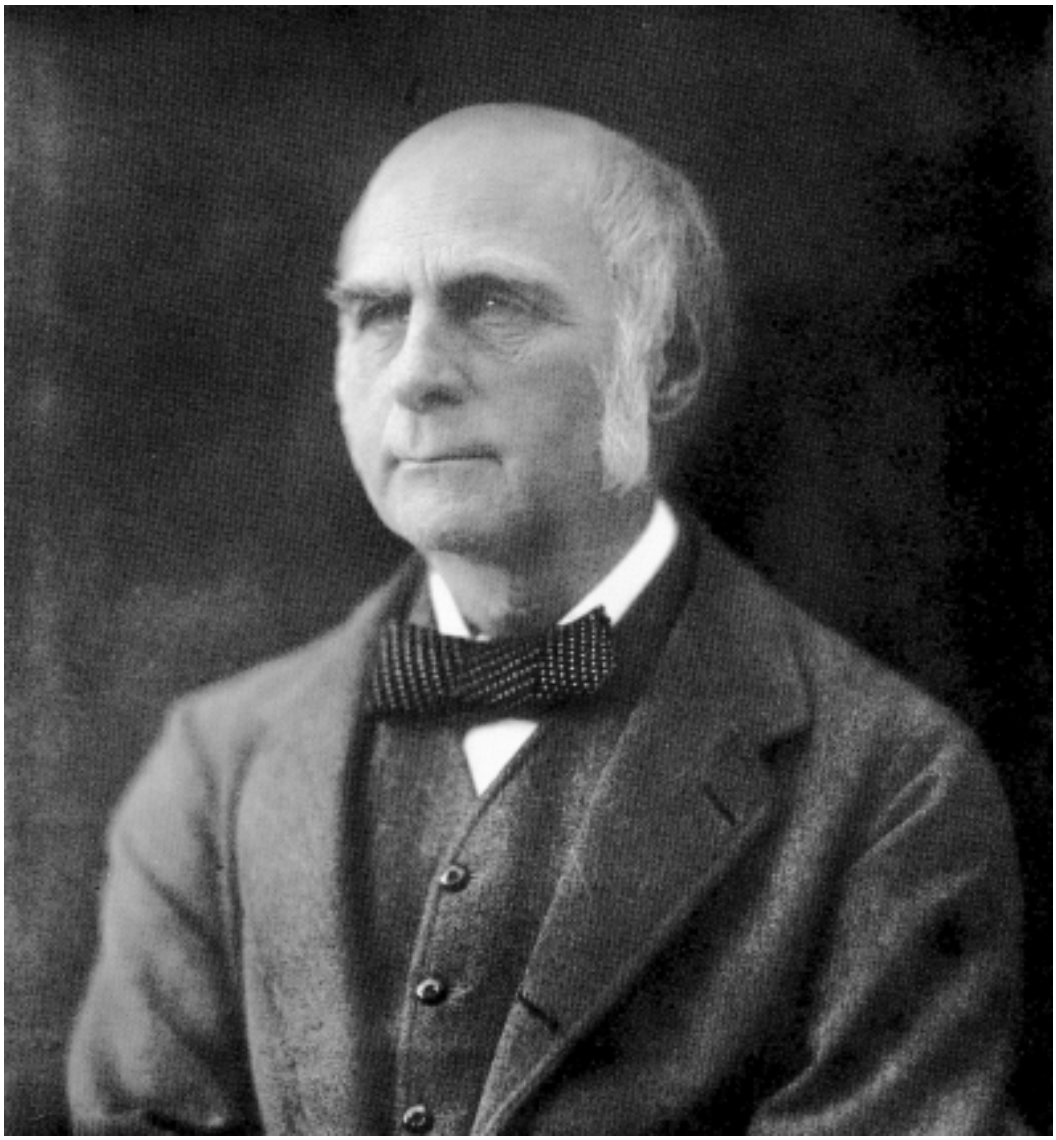
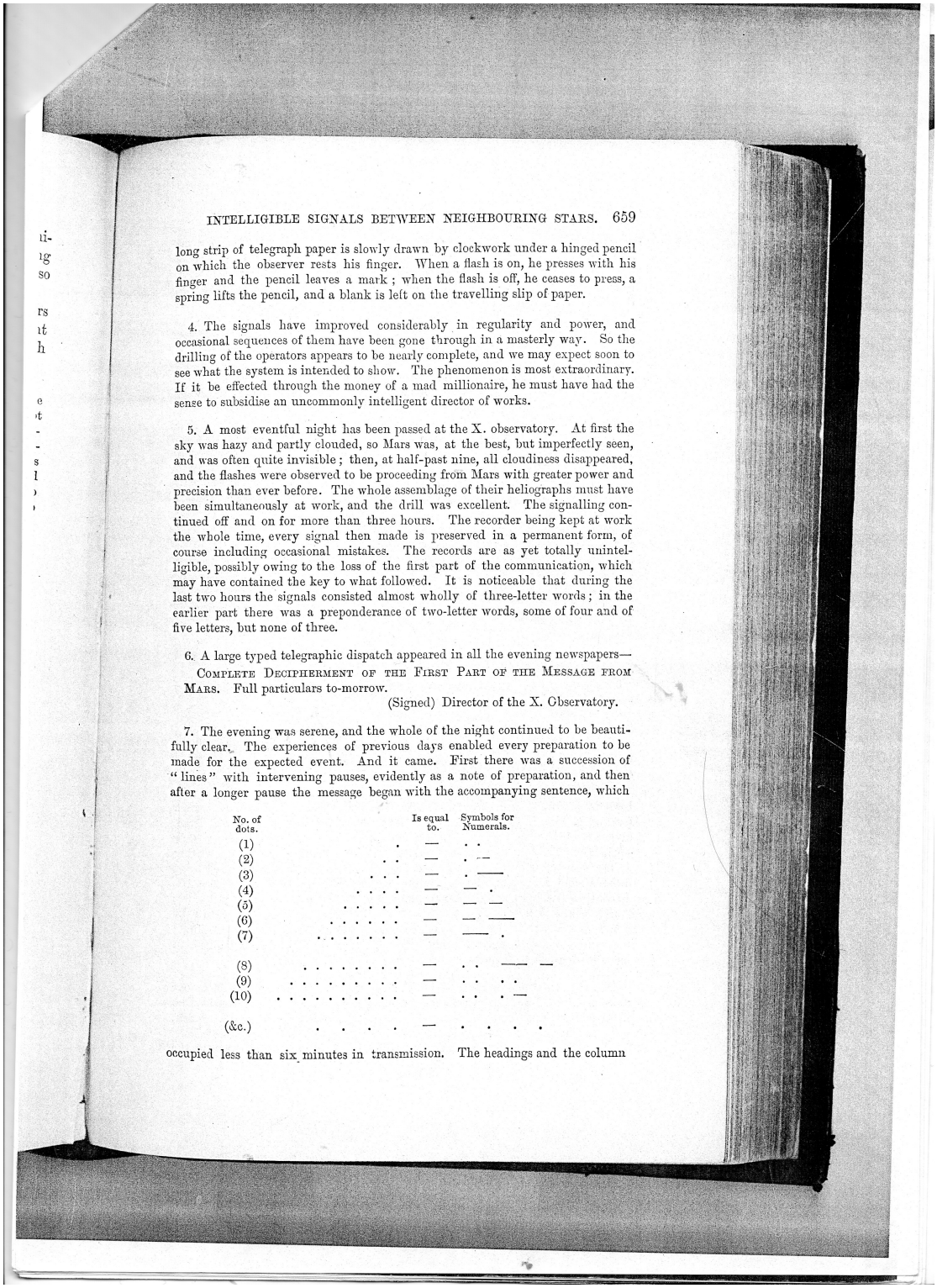


Fig. 1.1 Francis Galton (image: Creative Commons).

Fig. 1.2 A Galton Heliostat (image: Galton Collection, UCL).



INTELLIGIBLE SIGNALS BETWEEN NEIGHBOURING STARS. 659

long strip of telegraph paper is slowly drawn by clockwork under a hinged pencil on which the observer rests his finger. When a flash is on, he presses with his finger and the pencil leaves a mark ; when the flash is off, he ceases to press, a spring lifts the pencil, and a blank is left on the travelling slip of paper.

4. The signals have improved considerably in regularity and power, and occasional sequences of them have been gone through in a masterly way. So the drilling of the operators appears to be nearly complete, and we may expect soon to see what the system is intended to show. The phenomenon is most extraordinary. If it be effected through the money of a mad millionaire, he must have had the sense to subsidise an uncommonly intelligent director of works.

5. A most eventful night has been passed at the X. observatory. At first the sky was hazy and partly clouded, so Mars was, at the best, but imperfectly seen, and was often quite invisible ; then, at half-past nine, all cloudiness disappeared, and the flashes were observed to be proceeding from Mars with greater power and precision than ever before. The whole assemblage of their heliographs must have been simultaneously at work, and the drill was excellent. The signalling continued off and on for more than three hours. The recorder being kept at work the whole time, every signal then made is preserved in a permanent form, of course including occasional mistakes. The records are as yet totally unintelligible, possibly owing to the loss of the first part of the communication, which may have contained the key to what followed. It is noticeable that during the last two hours the signals consisted almost wholly of three-letter words ; in the earlier part there was a preponderance of two-letter words, some of four and of five letters, but none of three.

6. A large typed telegraphic dispatch appeared in all the evening newspapers—

COMPLETE DECIPHERMENT OF THE FIRST PART OF THE MESSAGE FROM MARS. Full particulars to-morrow.

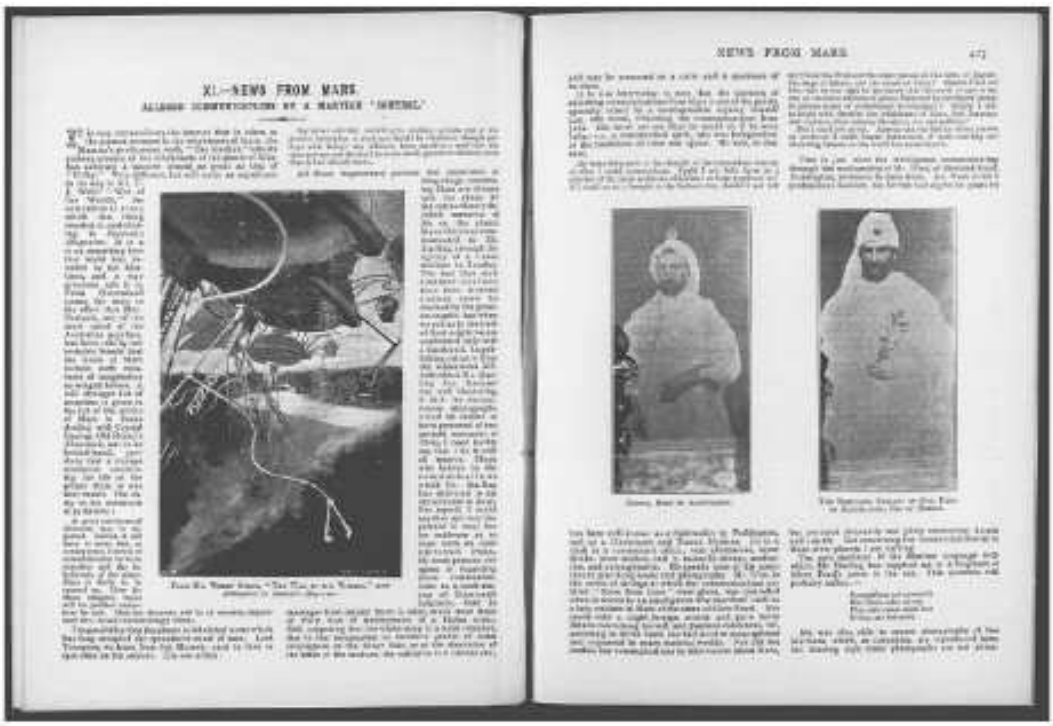
(Signed) Director of the X. Observatory.

7. The evening was serene, and the whole of the night continued to be beautifully clear. The experiences of previous days enabled every preparation to be made for the expected event. And it came. First there was a succession of "lines" with intervening pauses, evidently as a note of preparation, and then after a longer pause the message began with the accompanying sentence, which

No. of dots.		Is equal to.	Symbols for Numerals.
(1)	.	—	. .
(2)	. .	—	. —
(3)	. . .	—	. ——
(4)	. . . .	—	— .
(5)	. . . . .	—	— —
(6)	. . . . .	—	— ——
(7)	. . . . .	—	—— .
(8)	. . . . .	—	. . —— —
(9)	. . . . .	—	. . . .
(10)	. . . . .	—	. . . —
(&c.)	. . . .	—	. . . .

occupied less than six minutes in transmission. The headings and the column

Fig. 1.3 A page of 'Intelligible Signals' (*Fortnightly Review*, November 1896), showing the rather subdued layout and a table (the piece's only one) explaining the rudiments of Galton's communication system.



XI.—NEWS FROM MARS.

NEWS FROM MARS. 473

Fig 1.4. The first two pages of W. T. Stead's 'News from Mars' (*Borderland*, October 1897), showing the equal authority given to the fictional illustration from *The War of the Worlds* (left) and the 'real' photographs of Martian spirits (right).

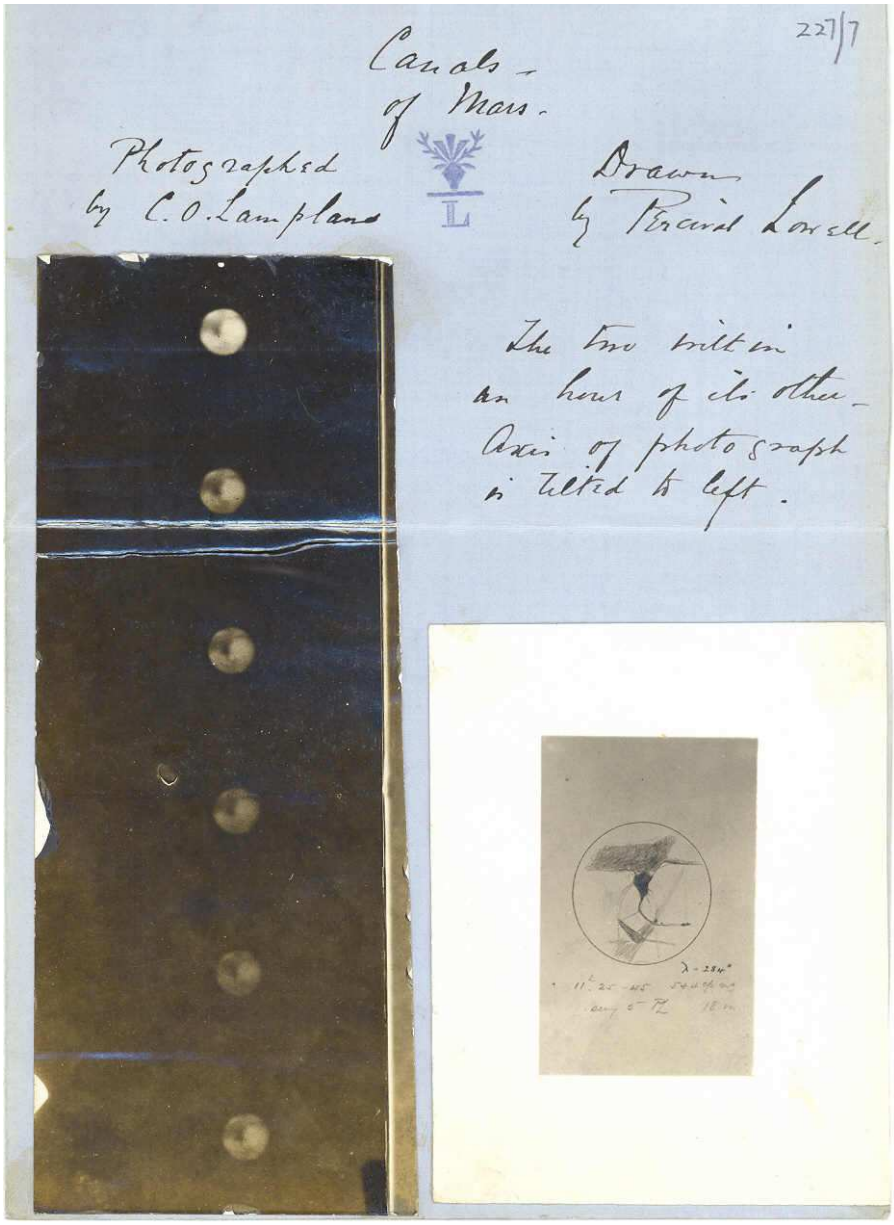
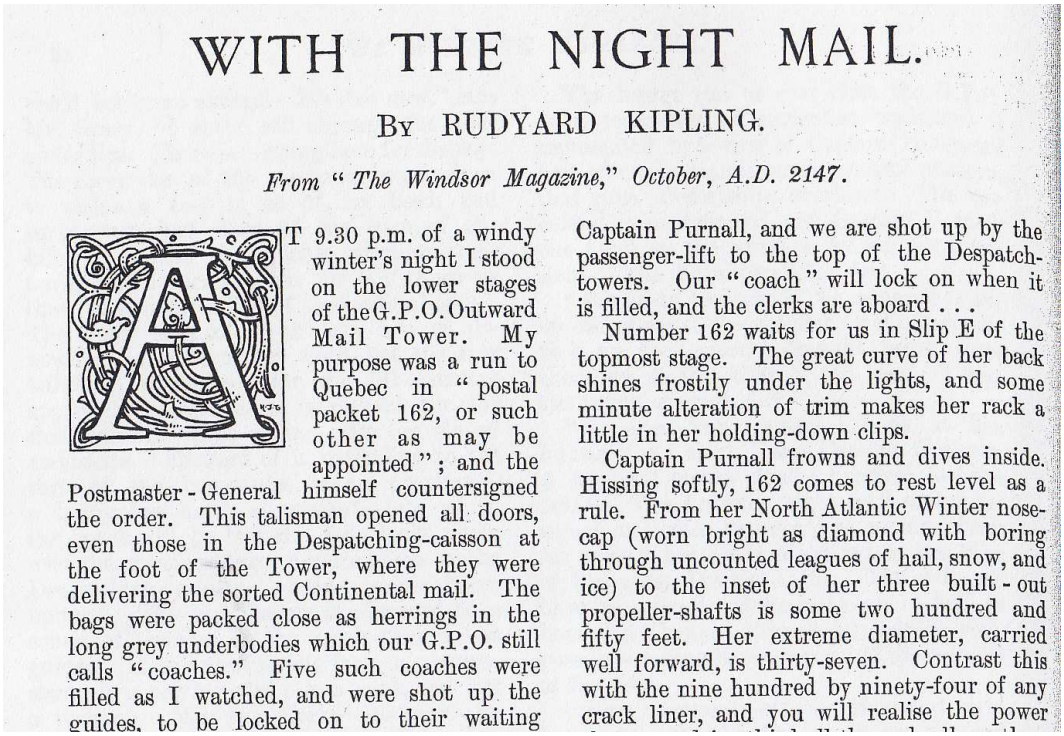


Fig. 1.5 It could have been anything: this picture of Mars, sent to Galton by Percival Lowell a decade after the composition of 'Intelligible Signals', reminds us just how tantalisingly vague Mars must have been (image: Galton Papers, UCL, 227/7).



WITH THE NIGHT MAIL.

BY RUDYARD KIPLING.

From "The Windsor Magazine," October, A.D. 2147.

AT 9.30 p.m. of a windy winter's night I stood on the lower stages of the G.P.O. Outward Mail Tower. My purpose was a run to Quebec in "postal packet 162, or such other as may be appointed"; and the Postmaster-General himself countersigned the order. This talisman opened all doors, even those in the Despatching-caisson at the foot of the Tower, where they were delivering the sorted Continental mail. The bags were packed close as herrings in the long grey underbodies which our G.P.O. still calls "coaches." Five such coaches were filled as I watched, and were shot up the guides, to be locked on to their waiting Captain Purnall, and we are shot up by the passenger-lift to the top of the Despatch-towers. Our "coach" will lock on when it is filled, and the clerks are aboard . . .

Number 162 waits for us in Slip E of the topmost stage. The great curve of her back shines frostily under the lights, and some minute alteration of trim makes her rack a little in her holding-down clips.

Captain Purnall frowns and dives inside. Hissing softly, 162 comes to rest level as a rule. From her North Atlantic Winter nose-cap (worn bright as diamond with boring through uncounted leagues of hail, snow, and ice) to the inset of her three built-out propeller-shafts is some two hundred and fifty feet. Her extreme diameter, carried well forward, is thirty-seven. Contrast this with the nine hundred by ninety-four of any crack liner, and you will realise the power

Fig 2.1 Header for 'With the Night Mail' (*Windsor*, December 1905) showing the prominent 'dateline'.

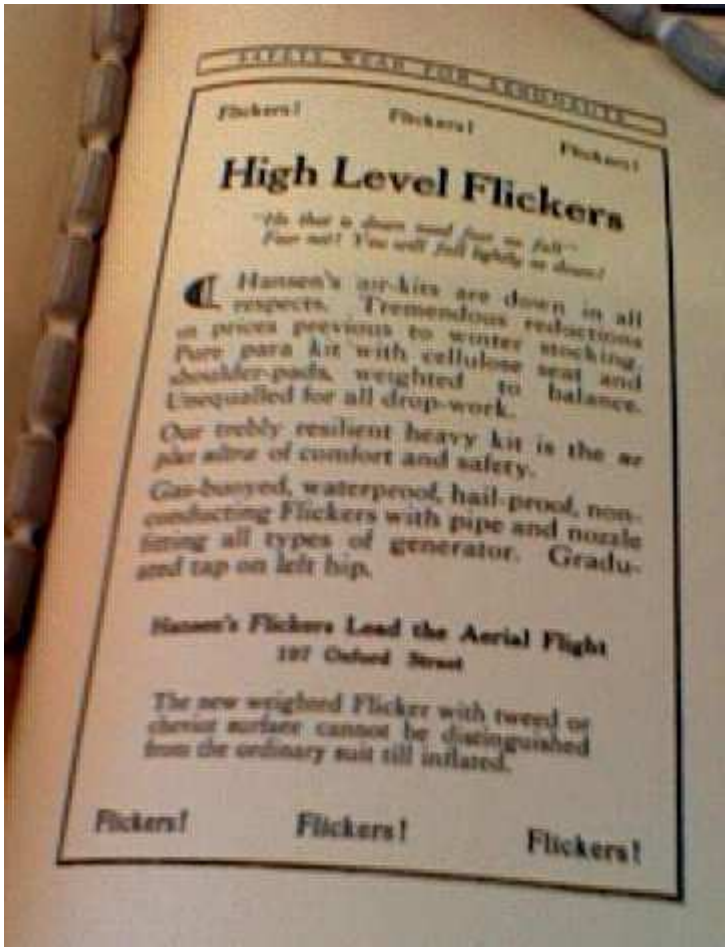
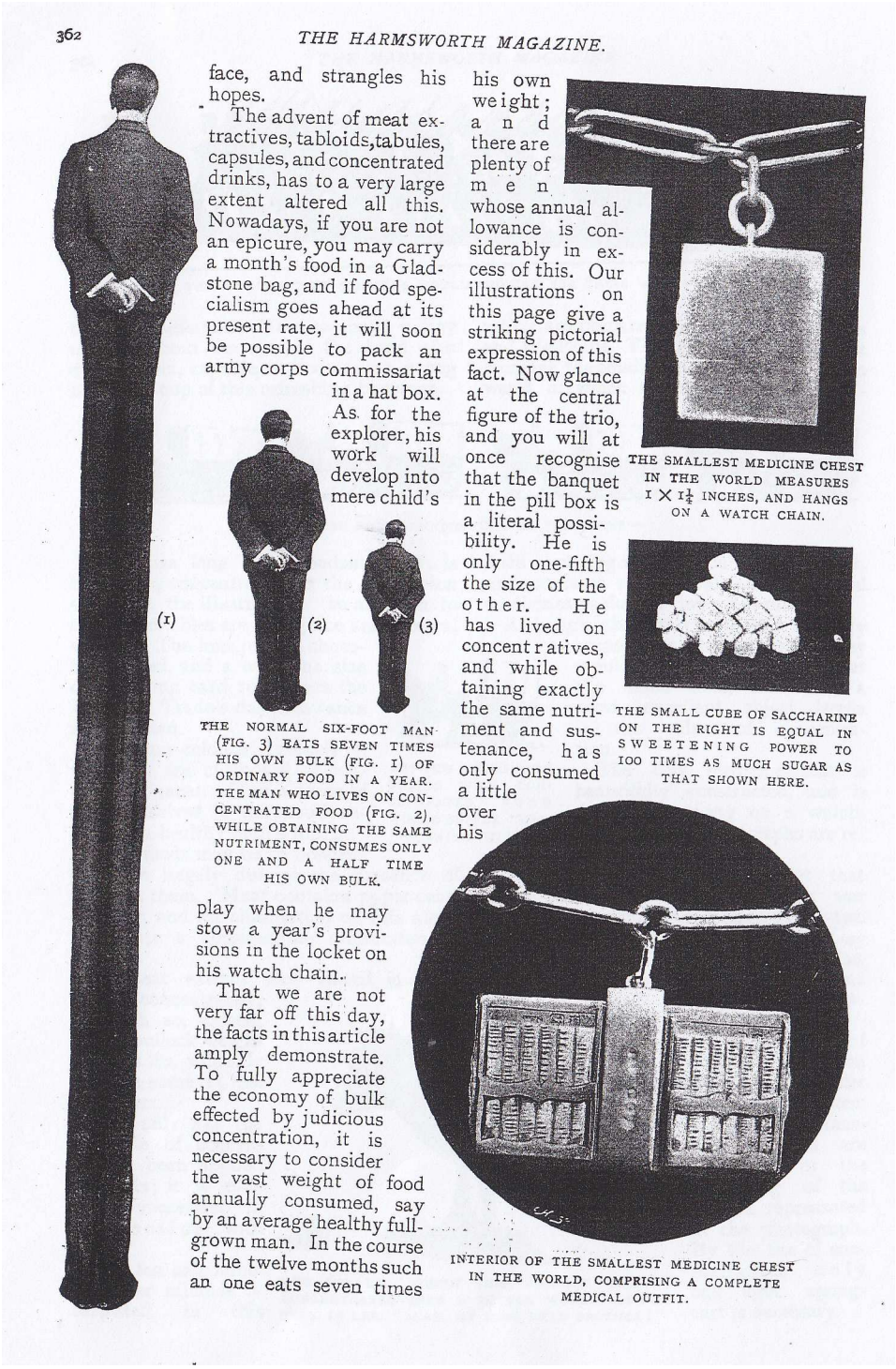


Fig 2.2 One of the 'magazine supplement' pages from the book edition of 'With the Night Mail', re-creating periodicity. This page is an advertisement for 'Hansen's Flickers', from a particular manufacturer of aerial equipment in Kipling's future world.



362 THE HARMSWORTH MAGAZINE.

face, and strangles his hopes.

The advent of meat extractives, tabloids, tabules, capsules, and concentrated drinks, has to a very large extent altered all this. Nowadays, if you are not an epicure, you may carry a month's food in a Gladstone bag, and if food specialism goes ahead at its present rate, it will soon be possible to pack an army corps commissariat in a hat box. As for the explorer, his work will develop into mere child's play when he may stow a year's provisions in the locket on his watch chain.

That we are not very far off this day, the facts in this article amply demonstrate. To fully appreciate the economy of bulk effected by judicious concentration, it is necessary to consider the vast weight of food annually consumed, say by an average healthy full-grown man. In the course of the twelve months such an one eats seven times his own weight; and there are plenty of men whose annual allowance is considerably in excess of this. Our illustrations on this page give a striking pictorial expression of this fact. Now glance at the central figure of the trio, and you will at once recognise that the banquet in the pill box is a literal possibility. He is only one-fifth the size of the other. He has lived on concentratives, and while obtaining exactly the same nutriment and sustenance, has only consumed a little over his

(1) (2) (3)

THE NORMAL SIX-FOOT MAN (FIG. 3) EATS SEVEN TIMES HIS OWN BULK (FIG. 1) OF ORDINARY FOOD IN A YEAR. THE MAN WHO LIVES ON CONCENTRATED FOOD (FIG. 2), WHILE OBTAINING THE SAME NUTRIMENT, CONSUMES ONLY ONE AND A HALF TIME HIS OWN BULK.

THE SMALLEST MEDICINE CHEST IN THE WORLD MEASURES 1 × 1¼ INCHES, AND HANGS ON A WATCH CHAIN.

THE SMALL CUBE OF SACCHARINE ON THE RIGHT IS EQUAL IN SWEETENING POWER TO 100 TIMES AS MUCH SUGAR AS THAT SHOWN HERE.

INTERIOR OF THE SMALLEST MEDICINE CHEST IN THE WORLD, COMPRISING A COMPLETE MEDICAL OUTFIT.

Fig. 2.3 A page from Alfred Arkas's 'A Twentieth Century Dinner' (*Harmsworth Monthly Pictorial*, May 1899), showcasing the new trend for 'informative' image manipulation.

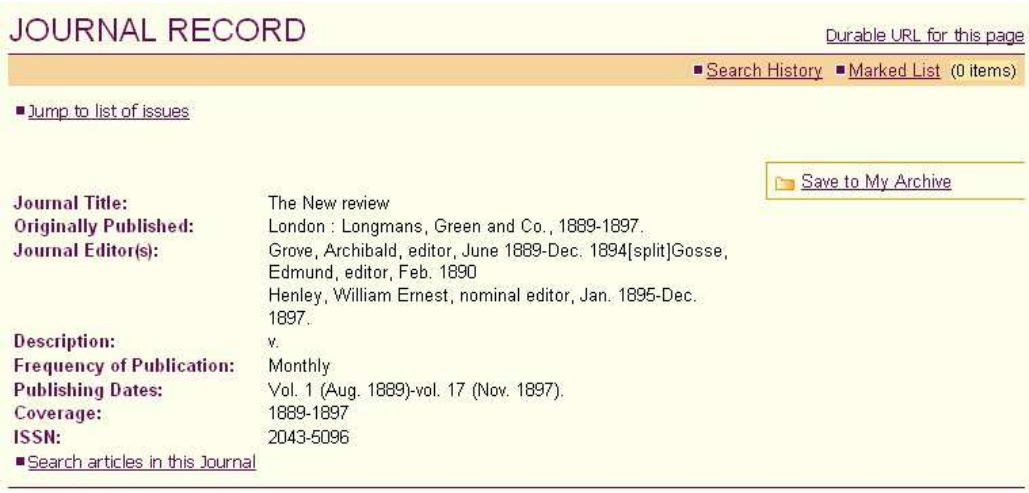


Fig. 2.4 Screenshot from ProQuest's *British Periodicals Online*, showing the qualities by which digitised periodicals are defined – note that physical properties do not appear.

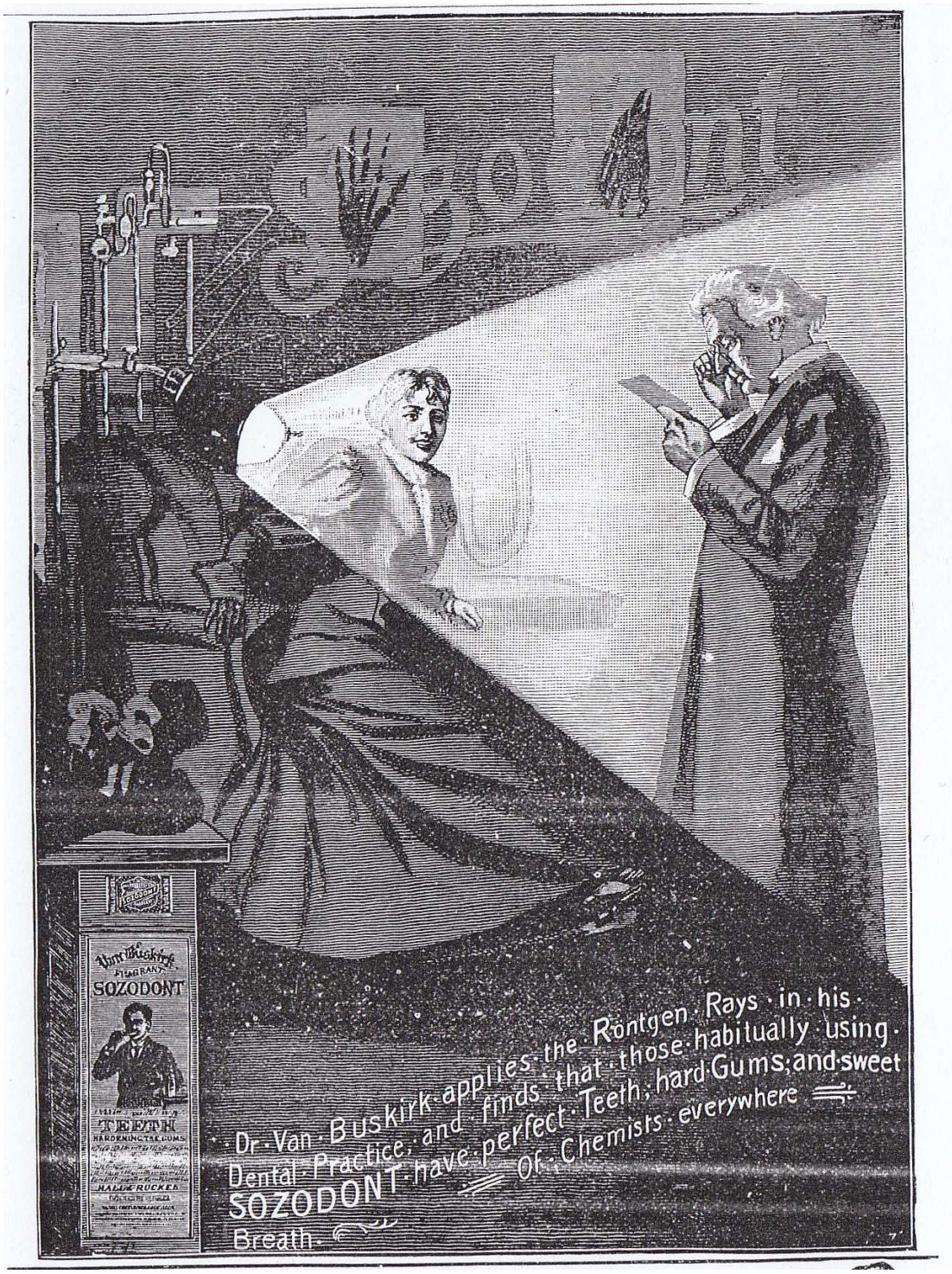


Fig 3.1 Sozodont Advertisement (*Strand*, July 1896).

Fig. 3.2 Sound Discs Advertisement (*Strand*, July 1896).

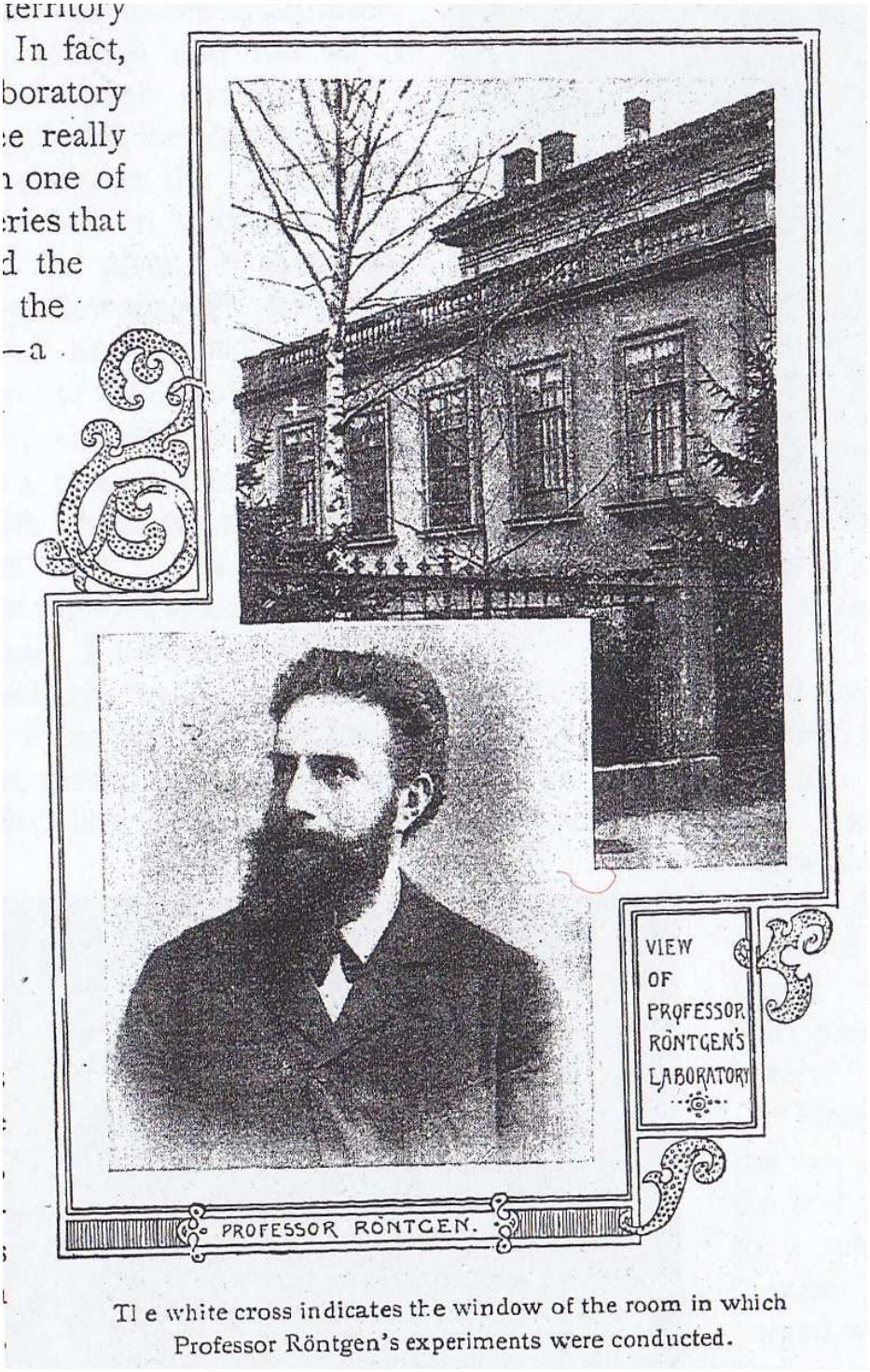
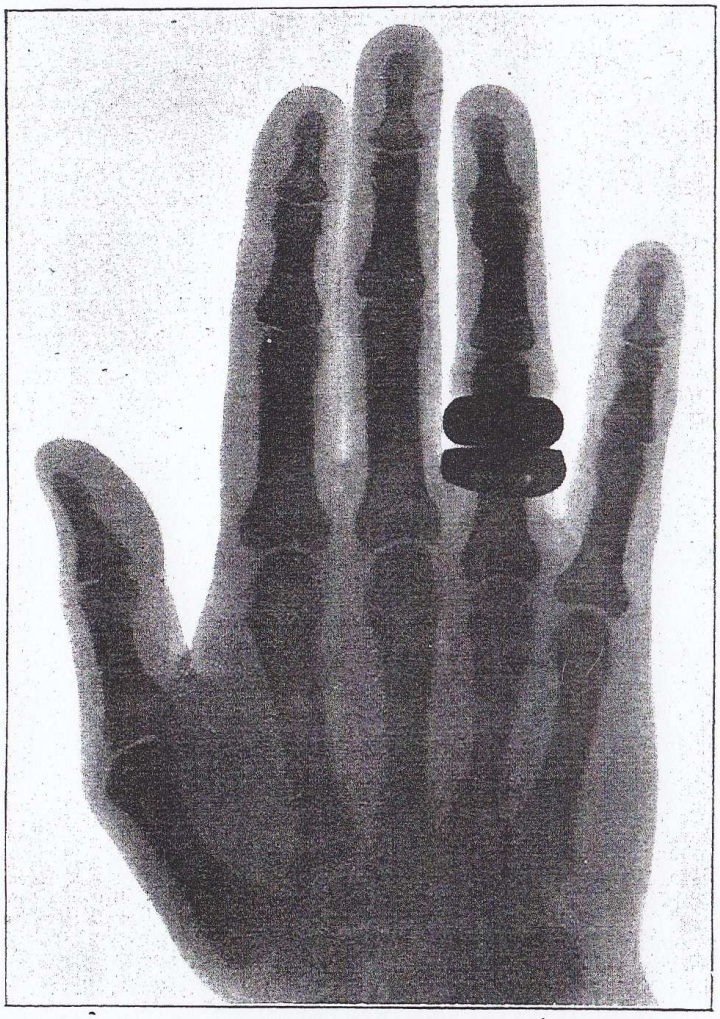


Fig. 3.3 The only images relating to Röntgen' personal life in *Pearson's Magazine*'s feature on him (April 1896). The caption hints at a paparazzi-like element to the journalism.

set in gilding. There is an ancient bedstead from Abyssinia, whilst blood-curdling knives, swords, and revolvers —one of which belonged to poor Cameron —literally bristle on the walls. There is also a Soudanese shield, and divers spears; the camel-saddle of my host, and the rug which he used as a camel-cloth; brass bowls from Burmah and a quaint chafing-dish stand on a table over which, in a case, repose the medals, with their many-coloured ribbons—Russian, Servian, Roumanian, the Khedivial Star, and the Order of Takova,—which have fallen to his share. There are also richly embroidered Japanese draperies and gowns lying here and there, which give a touch of beautiful colour to the unique studio.



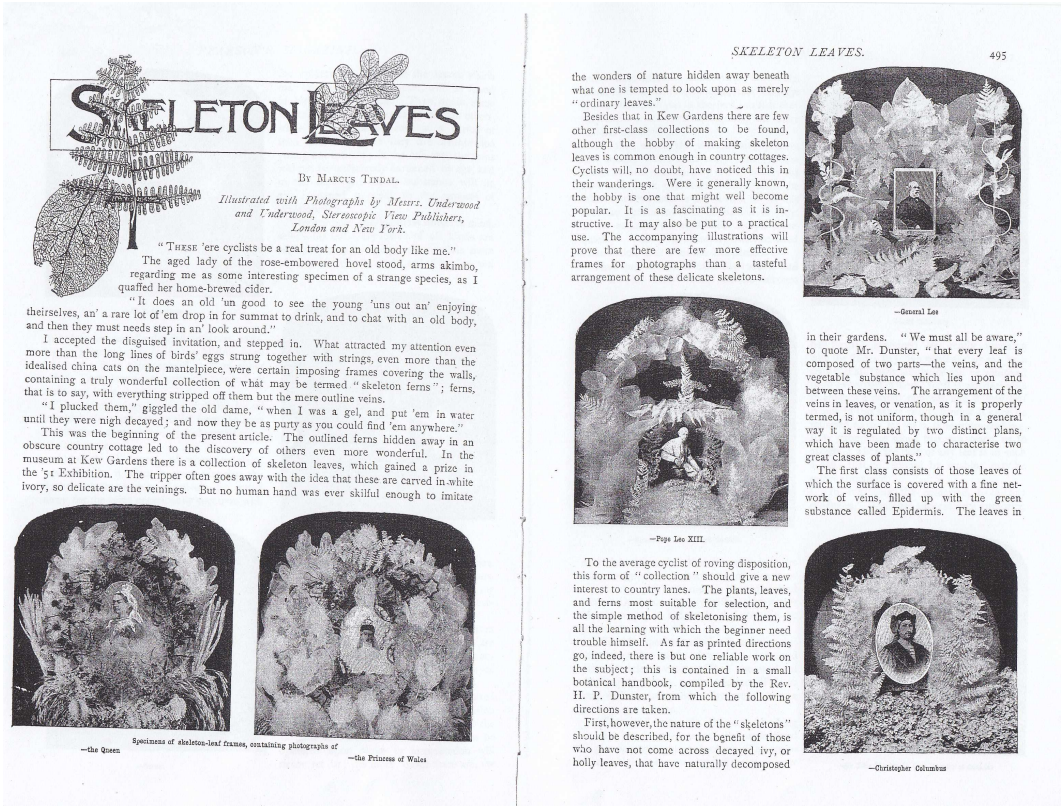
Mr. Fred. Villiers' hand by Röntgen Rays (by Professor Silvanus P. Thompson).

"How did you come to start on *The Graphic*?" I ask abruptly, as the war correspondent leisurely seats himself and searches for a cigarette, having found me and my note-book a resting-place on the most comfortable divan possible, which is covered by a beautiful silk flag—a memento of the massacre he witnessed at Port Arthur.

"My start on *The Graphic* came most unexpectedly. One afternoon I was sauntering down Holborn when I noticed a little crowd reading the poster of an evening paper which set forth that Prince Milan of Servia had declared war against Turkey. It occurred to me on the moment to write to the Editor of *The Graphic*. I did not even wait to get home, but, going into the British Museum, sat down and wrote a letter offering my services as war artist in the coming campaign. I shall not easily forget the delightful state of suspense I was in from that moment, or what my feelings were when morning brought me a wire from Mr. Thomas—'See me at my private address.

Fig. 3.4 A page from the *Idler*'s interview with Frederic Villiers, dominated by an X-ray of his hand (September 1897).

Fig. 3.5 Photograph, reproduced in *Pearson's Magazine*, of skeleton leaves as a frame for an image of Queen Victoria (November 1897).



SKELETON LEAVES

By Marcus Tindal.

Illustrated with Photographs by Messrs. Underwood and Underwood, Stereoscopic View Publishers, London and New York.

"These 'ere cyclists be a real treat for an old body like me."

The aged lady of the rose-embowered hovel stood, arms akimbo, regarding me as some interesting specimen of a strange species, as I quaffed her home-brewed cider.

"It does an old 'un good to see the young 'uns out an' enjoying theirselves, an' a rare lot of 'em drop in for summat to drink, and to chat with an old body, and then they must needs step in an' look around."

I accepted the disguised invitation, and stepped in. What attracted my attention even more than the long lines of birds' eggs strung together with strings, even more than the idealised china cats on the mantelpiece, were certain imposing frames covering the walls, containing a truly wonderful collection of what may be termed "skeleton ferns"; ferns, that is to say, with everything stripped off them but the mere outline veins.

"I plucked them," giggled the old dame, "when I was a gel, and put 'em in water until they were nigh decayed; and now they be as purty as you could find 'em anywhere."

This was the beginning of the present article. The outlined ferns hidden away in an obscure country cottage led to the discovery of others even more wonderful. In the museum at Kew Gardens there is a collection of skeleton leaves, which gained a prize in the '51 Exhibition. The tripper often goes away with the idea that these are carved in white ivory, so delicate are the veinings. But no human hand was ever skilful enough to imitate

Specimens of skeleton-leaf frames, containing photographs of —the Queen —the Princess of Wales

SKELETON LEAVES. 495

the wonders of nature hidden away beneath what one is tempted to look upon as merely "ordinary leaves."

Besides that in Kew Gardens there are few other first-class collections to be found, although the hobby of making skeleton leaves is common enough in country cottages. Cyclists will, no doubt, have noticed this in their wanderings. Were it generally known, the hobby is one that might well become popular. It is as fascinating as it is instructive. It may also be put to a practical use. The accompanying illustrations will prove that there are few more effective frames for photographs than a tasteful arrangement of these delicate skeletons.

—General Lee

—Pope Leo XIII.

To the average cyclist of roving disposition, this form of "collection" should give a new interest to country lanes. The plants, leaves, and ferns most suitable for selection, and the simple method of skeletonising them, is all the learning with which the beginner need trouble himself. As far as printed directions go, indeed, there is but one reliable work on the subject; this is contained in a small botanical handbook, compiled by the Rev. H. P. Dunster, from which the following directions are taken.

First, however, the nature of the "skeletons" should be described, for the benefit of those who have not come across decayed ivy, or holly leaves, that have naturally decomposed in their gardens. "We must all be aware," to quote Mr. Dunster, "that every leaf is composed of two parts—the veins, and the vegetable substance which lies upon and between these veins. The arrangement of the veins in leaves, or venation, as it is properly termed, is not uniform, though in a general way it is regulated by two distinct plans, which have been made to characterise two great classes of plants."

The first class consists of those leaves of which the surface is covered with a fine network of veins, filled up with the green substance called Epidermis. The leaves in

—Christopher Columbus

Fig. 3.6 A double-page spread from the skeleton leaves article, showing five of the leaf displays and also the style of line illustration used as a header.

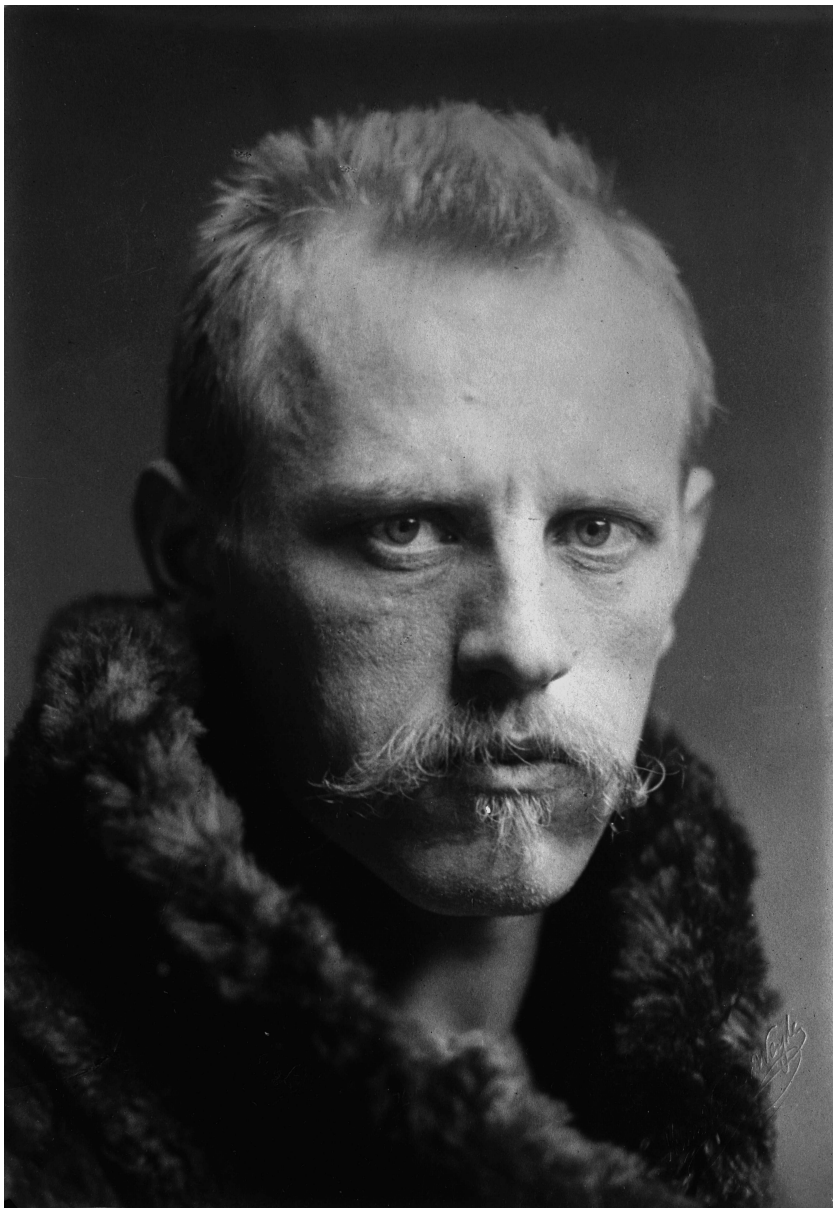
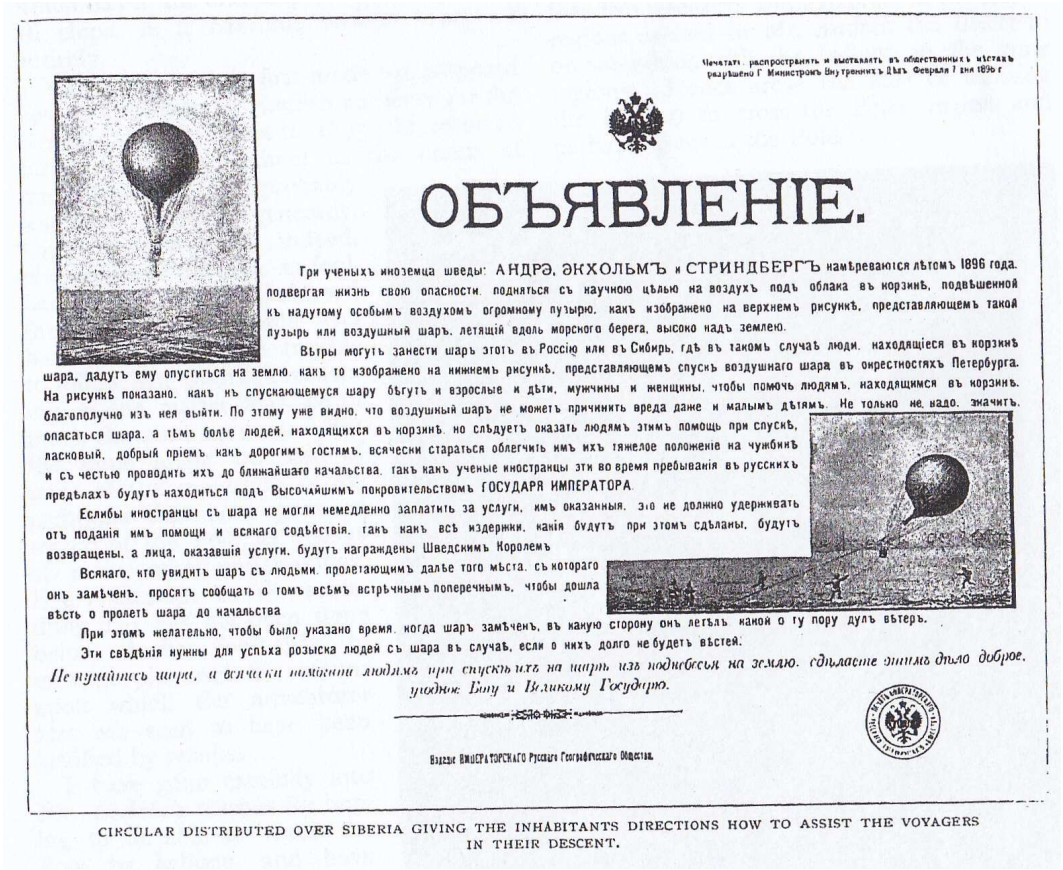


Fig 4.1 Fridtjof Nansen (source: Wikimedia Commons).

Fig. 4.2 *Fram*, frozen into the polar ice (source: Wikimedia Commons).



Печатать, распространять и выставлять въ общественныхъ мѣстахъ разрѣшено Г. Министромъ Внутреннихъ Дѣлъ. Февраля 7 дня 1896 г.

ОБЪЯВЛЕНІЕ.

Три ученыхъ иноземца шведы: АНДРЭ, ЭКХОЛЬМЪ и СТРИНДБЕРГЪ намѣреваются лѣтомъ 1896 года, подвергая жизнь свою опасности, подняться съ научною цѣлью на воздухъ подъ облака въ корзинѣ, подвѣшенной къ надутому особымъ воздухомъ огромному пузырю, какъ изображено на верхнемъ рисункѣ, представляющемъ такой пузырь или воздушный шаръ, лѣтящій вдоль морского берега, высоко надъ землею.

Вѣтры могутъ занести шаръ этотъ въ Россію или въ Сибирь, гдѣ въ такомъ случаѣ люди, находящіеся въ корзинѣ шара, дадутъ ему опуститься на землю, какъ то изображено на нижнемъ рисункѣ, представляющемъ спускъ воздушнаго шара въ окрестностяхъ Петербурга. На рисункѣ показано, какъ къ спускающемуся шару бѣгутъ и взрослые и дѣти, мужчины и женщины, чтобы помочь людямъ, находящимся въ корзинѣ, благополучно изъ нея выйти. По этому уже видно, что воздушный шаръ не можетъ причинить вреда даже и малымъ дѣтямъ. Не только не надо, значитъ, опасаться шара, а тѣмъ болѣе людей, находящихся въ корзинѣ, но слѣдуетъ оказать людямъ этимъ помощь при спускѣ, ласковый, добрый пріемъ какъ дорогимъ гостямъ, всячески стараться облегчить имъ ихъ тяжелое положеніе на чужбинѣ и съ честью проводить ихъ до ближайшаго начальства, такъ какъ ученые иностранцы эти во время пребыванія въ русскихъ предѣлахъ будутъ находиться подъ Высочайшимъ покровительствомъ ГОСУДАРЯ ИМПЕРАТОРА.

Еслибы иностранцы съ шара не могли немедленно заплатить за услуги, имъ оказанныя, это не должно удерживать отъ поданія имъ помощи и всякаго содѣйствія, такъ какъ всѣ издержки, какія будутъ при этомъ сдѣланы, будутъ возвращены, а лица, оказавшія услуги, будутъ награждены Шведскимъ Королемъ.

Всякаго, кто увидитъ шаръ съ людьми, пролетающимъ далѣе того мѣста, съ котораго онъ замѣченъ, просятъ сообщать о томъ всѣмъ встрѣчнымъ поперечнымъ, чтобы дошла вѣсть о пролетѣ шара до начальства.

При этомъ желательно, чтобы было указано время, когда шаръ замѣченъ, въ какую сторону онъ легъ и какой о ту пору дулъ вѣтеръ.

Эти свѣдѣнія нужны для успѣха розыска людей съ шара въ случаѣ, если о нихъ долго не будетъ вѣстей.

Не пугайтесь шара, и всячески помогите людямъ при спускѣ ихъ на шарѣ изъ поднебесья на землю. сдѣлаете этимъ дѣло доброе, уподобя Ему и Великому Государю.

Издано ИМПЕРАТОРСКАГО Русскаго Географическаго Общества.

CIRCULAR DISTRIBUTED OVER SIBERIA GIVING THE INHABITANTS DIRECTIONS HOW TO ASSIST THE VOYAGERS IN THEIR DESCENT.

Fig. 4.3 Andrée's circular, reproduced in the *Strand* magazine, July 1896.

"A DOG RIB INDIAN BROUGHT IT DOWN WITH A SHOT FROM HIS GUN" (*p.* 489).

Fig. 4.4 The unexpected appearance of a stereotyped Indian in Munro's 'How I Discovered the North Pole' (*Cassell's Magazine*, June 1894).

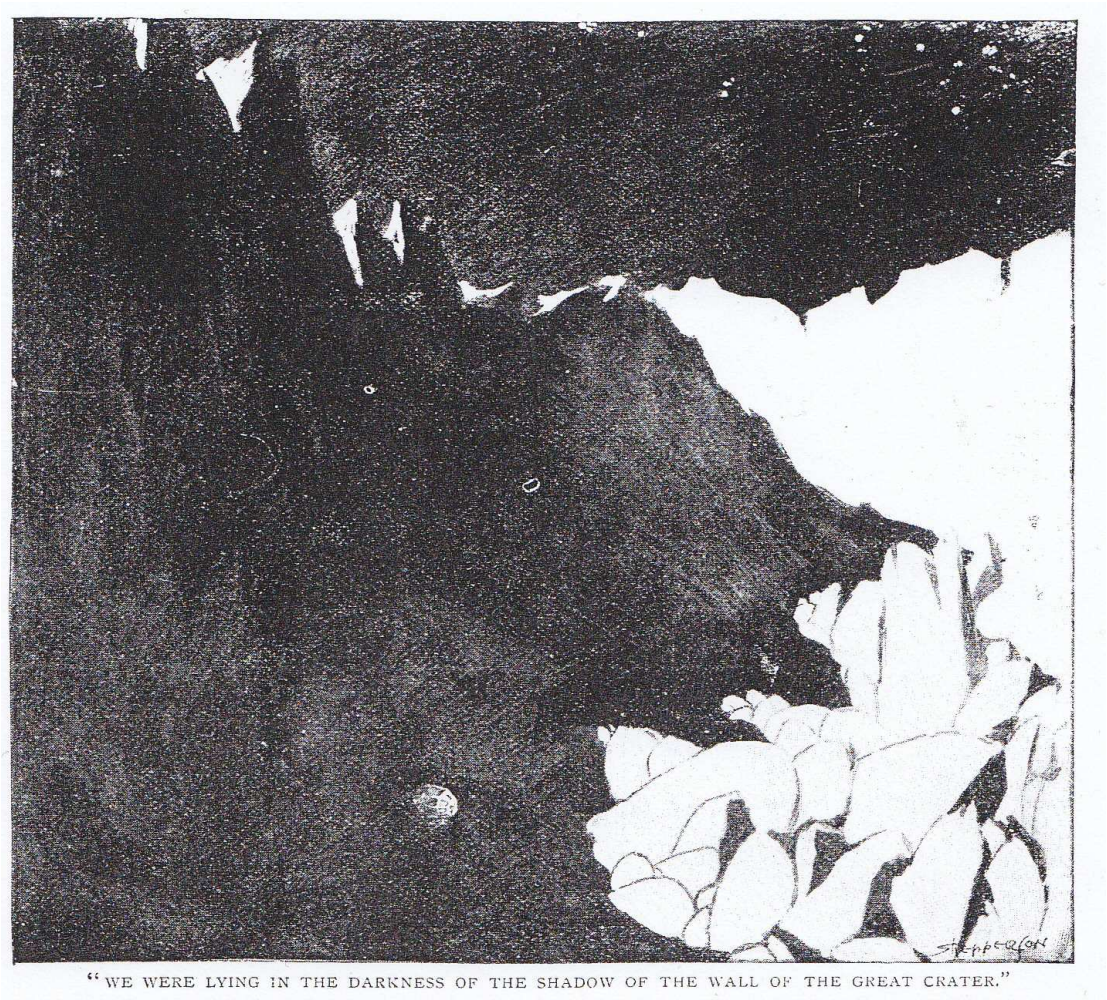


Fig. 4.5 The Moon as Arctic – illustration from the original run of *The First Men in the Moon* in the *Strand* (January 1901).

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Note: For primary periodical sources, I have broken with MHRA bibliographic convention in providing full publication dates. A year alone is frequently insufficient information to find an article quickly in these older publications, especially when consulting a digital resource. I observe MHRA standards on secondary sources.

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